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GOLDEN MEADOWS RESIDENTIAL PROJECT

City of Menifee

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1. INTRODUCTION

This document is an Addendum to the County of Riverside's (County) certified Environmental Impact Report (EIR) No. 458 (SCH No. 2003061122), which analyzed potential environmental effects associated with Tentative Tract Map (TTM) No. 31194, Change of Zone (CZ) No. 06764, General Plan Amendment (GPA) No. 00729 and associated discretionary actions (the Approved Project). TTM No. 31194 allows development of 486 single-family residential lots, three park sites, three water quality basins, over 49 acres of natural open space and common landscape area, and associated infrastructure and utilities on a 204.7-gross-acre property north of Wickerd Road and west of Ascot Way in unincorporated Riverside County.

An EIR for the Approved Project was certified by the County on April 10, 2007 (Certified EIR). The Certified EIR addressed potential impacts to the physical environment that would or may occur from implementation of the Approved Project. This Addendum to the Certified EIR has been prepared in accordance with Sections 15162 and 15164 of the California Environmental Quality Act (CEQA) Guidelines. The City of Menifee (City), as the lead agency under CEQA, has prepared this Addendum to the Certified EIR to consider environmental impacts associated with proposed Major Modification No. PLN21-0199 and Change of Zone No. PLN21-0201, which would entail changes to Phase 4 of the approved TTM No. 31194 (Proposed Project) and changes to the approved zoning code through a zoning text amendment.

1.1 PURPOSE OF AN EIR ADDENDUM

According to CEQA Guidelines, Section 15164(a), an addendum shall be prepared if some changes or additions to a previously certified EIR are necessary, but none of the conditions enumerated in CEQA Guidelines Sections 15162(a)(1) to (3) calling for the preparation of a subsequent EIR have occurred. As stated in CEQA Guidelines Section 15162 (Subsequent EIRs and Negative Declarations):

> When an EIR has been certified or negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:
>
> 1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
> 2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
> 3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or negative declaration was adopted, shows any of the following:

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(a) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(b) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(c) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(d) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The proposed changes that would result from the development of the Proposed Project would not result in any of the conditions outlined in CEQA Guidelines Sections 15162(a)(1) to (3) because the proposed changes would not result in new significant environmental effects or a substantial increase in the severity of previously identified significant effects requiring major revisions to the Certified EIR, and, as explained herein, no new information of substantial importance meets any of the conditions in CEQA Guidelines Section 15162 (a)(3). Accordingly, this Addendum provides the substantial evidence required by CEQA Guidelines Section 15164(e) to support the finding that a subsequent EIR is not required and an addendum to the Certified EIR is the appropriate environmental document to address changes to the Proposed Project.

As stated in CEQA Guidelines Section 15164, "Addendum to an EIR":

(a) The lead agency or responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred.

(b) An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred.

(c) An addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration.

(d) The decision-making body shall consider the addendum with the final EIR or adopted negative declaration prior to making a decision on the project.

(e) A brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR, the lead agency's findings on the project, or elsewhere in the record. The explanation must be supported by substantial evidence.

1.2 SCOPE OF ANALYSIS FOR THIS ADDENDUM

This Addendum evaluates the proposed Major Modification No. PLN21-0199 and Change of Zone No. PLN21-0201, which would entail changes to Phase 4 of the approved Tentative Tract Map No. 31194 (Proposed Project) and changes to the approved zoning code through a zoning text amendment. The Addendum also considers whether there is any new information of substantial importance that was not known

and could not have been known with exercise of reasonable diligence at the time that the EIR was certified. The Addendum examines whether, as a result of any changes or any new information, a subsequent EIR may be required. This examination includes an analysis of the provisions of California Public Resources Code Section 21166 and Section 15162 of the CEQA Guidelines and their applicability to the Proposed Project.

As lead agency under CEQA, the City is required to evaluate the environmental impacts associated with the Proposed Project because it entails a proposed discretionary approval that is subject to CEQA. The scope of the review for project-related impacts for this Addendum is focused on the differences between impacts analyzed by the Certified EIR for the Approved Project and impacts under the Proposed Project. The Approved Project will serve as the "baseline" for evaluating the impacts of the Proposed Project. The baseline includes all applicable mitigation measures from the Certified EIR. As required by CEQA, this Addendum also addresses changes in circumstances or new information that would potentially involve new environmental impacts. Appendix A of this Addendum includes the adopted Mitigation Monitoring and Reporting Program (MMRP) for the Certified EIR. Appendix B includes an updated MMRP for the Proposed Project.

1.3 PREVIOUS ENVIRONMENTAL DOCUMENTATION

1.3.1 2007 Certified Environmental Impact Report

The County's Certified EIR evaluated three discretionary actions for the Approved Project:

- Tentative Tract Map (TTM No. 31194)
- Change of Zone (CZ No. 06764)
- Circulation Element General Plan Amendment (GPA No. 00729)

As required by CEQA, the County adopted an MMRP, Findings, and a Statement of Overriding Considerations. After incorporation of the City of Menifee, the Approved Project, Certified EIR, and all approvals transferred to the City. The Certified EIR found that the Approved Project would result in less-than-significant impacts with no mitigation with regard to:

- Energy Resources
- Hydrology, Flooding, and Drainage
- Land Use Consistency
- Mineral Resources
- Utilities
- Water and Wastewater

The Certified EIR found that the Approved Project would result in less-than-significant after implementation of mitigation measures with regard to:

- Aesthetics, Visual Quality, Light and Glare
- Agricultural
- Air Quality [PM-10, VOC]
- Archaeological Resources
- Biological Resources
- Circulation and Traffic [direct impacts]
- Noise
- Open Space and Recreation
- Paleontological Resources
- Schools
- Sheriff Services
- Soils, Slopes, and Erosion Potential

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- Disaster Preparedness
- Fire Protection
- Geology and Slope Stability
- Healthcare Services
- Libraries
- Solid Waste
- Toxic Substances
- Water Quality

The Certified EIR determined that implementation of the Approved Project would result in significant and unavoidable impacts to the following environmental topics:

- Air Quality [NOx, CO]
- Circulation and Traffic [cumulative impacts]

2. APPROVED PROJECT

2.1 PROJECT BACKGROUND

2.1.1 Approved Project Location

According to the Southern California Association of Governments' (SCAG) "Local Profiles," the Approved Project was in unincorporated Riverside County until the City of Menifee incorporated in 2008 (SCAG 2019); thus the Approved Project Site, including Phases 1 to 4 (herein referred to as the TTM 31194 site), is now in the City of Menifee. As described in the Certified EIR, the TTM 31194 site is northwest of Murrieta, southeast of Canyon Lake and Perris, and southeast of Lake Elsinore.

The TTM 31194 site is currently vacant and surrounded by Wickerd Road to the south, Garbani Road to the north, Sherman Road to the east, and Evans Road to the west, in the City of Menifee, in Riverside County (Assessor's Parcel Numbers 360-300-002, -003, -004, -005, -006, and -009 and 360-350-001). Local access is provided via Newport Road to the north, Murrieta Road to the west, and Scott Road to the south, and regional access is provided via the Interstate 215 (I-215), approximately a mile east of the TTM 31194 site.

Regional access to the east of the TTM 31194 site is provided via the Scott Road and Newport Road exits from I-215. The TTM 31194 site is bounded on the north, south, and west by vacant land and some rural residential homes. An approved tentative tract map, referred to as Hidden Hills (TTM No. 30142), is immediately to the northwest and is approved for 523 single-family residential lots and a community park and greenbelts; the property to the east consists of hills with rock outcroppings.

2.1.2 Approved Project Description

The Approved Project includes the following elements:

- **Tentative Tract Map No. 31194.** The Approved Project allowed the subdivision of the 204.7-acre site into a maximum of 486 single-family residential lots (6,000-square-foot minimum) on 101.3 acres, three neighborhood park lots on 6.8 acres, seven open space/drainage easement lots on 0.5 acre, three water quality basins on 2.7 acres, and 31 open space/landscape lots on 49.8 acres. Implementation of the Approved Project also included circulation improvements, a drainage plan, a water and sewer plan, and additional off-site improvements.

- **Change of Zone No. 06764.** The Approved Project changed the zoning classifications on the site from Residential Agriculture (One-acre minimum lot size)(R-A-1), Residential Agriculture (Five-acre minimum lot size)(R-A-5), Light Agriculture (One-acre minimum lot size)(A-1-1) and Light Agriculture (Ten acre minimum lot size)(A-1-10) to One Family Dwellings (R-1), Planned Residential (R-4) and Open Area Combined Development (R-5).

2. Approved Project

- **General Plan Amendment No. 00729.** The Approved Project established the alignment of Garbani Road and Wickerd Road. The County's General Plan Circulation Element previously showed Garbani Road extending east of Evans Road in an east-west alignment as a Major Roadway (118-foot ROW) and previously showed Wickerd Road extending east of Evans Road also in an east-west alignment as a Secondary Roadway (100-foot ROW). The Approved Project provided for the realignment of Garbani Road in a northwest-southeast alignment through the middle of the Approved Project Site as a Major Roadway (118-foot ROW) to connect to existing Wickerd Road at the Approved Project Site's southeast corner. GPA No. 00729 proposed the following:

  - Upgrade and change the alignment of Wickerd Road between Haun Road and Evans Road from a Secondary to a Major.
  - Reduce Garbani Road from an Urban Arterial to a Secondary between Haun Road and Bradley Road.
  - Reduce Garbani Road from a Major to a Collector between Bradley Road and its new terminus east of Evans Road.
  - Reduce Bradley Road from a Major to a Secondary between Craig Avenue and Garbani Road.
  - Correct a mapping error to remove an unnamed Secondary between Wickerd Road and Evans Road.

3. PROPOSED PROJECT

3.1 PROPOSED PROJECT DESCRIPTION

The TTM 31194 site was previously identified as a Planned Development by Title 9 of the City of Menifee Municipal Code. The Proposed Project will revise Section 9.155.030 of the municipal code, Planned Development Districts, which contains planned developments that were approved by the County prior to incorporation. Section 9.155.030 of the municipal code currently describes the planned development of the Approved Project; thus, revisions to the section would revise the description of the planned development to be consistent with the Proposed Project.

The Proposed Project would develop Phase 4 of the Approved Project—268 total lots on 87.59 acres—as shown in Table 1, *Proposed Project Lots*.

Table 1 Proposed Project Lots

Lot	Land Use	Acreage
1-259	Residential Lots	28.84
A	Park	2.94
B	Recreation Center	0.75
C	Access Road/Parking	0.15
D	Drainage Easement	0.04
E-G	Open Space	41.97
H	Water Quality Basin	1.30
	Public Streets	11.60
	Total	**87.59**

3.2 PROJECT SITE LOCATION

The Proposed Project would be in the same location as the Approved Project, as described in Section 2.1.1, *Approved Project Location*. It would be on the eastern part of the TTM 31194 site, north of Wickerd Road, south of Garbani Road, and west Haun Road and I-215 (Project Site).

3.2.1 Surrounding Land Uses

The Project Site has a land use designation of 2.1–5 du/ac Residential (2.1-5 R), and is zoned Planned Development District (PDO-5). General plan land use designations in the surrounding areas include Rural Residential 5 ac min (RR5) to the north and east, Rural Residential 1 ac min (RR1) and Rural Residential ½ ac min (RR1/2) to the south, and 2.1–5 du/ac Residential (2.1-5 R) to the west.

3.3 PROJECT IMPROVEMENTS

3.3.1 Residential Dwelling Units

As shown in Table 2, *Residential Dwelling Units*, with implementation of the Proposed Project, Phase 4 of the residential development would add 98 additional dwelling units for a total of 259 dwelling units compared to the 161 units proposed by the Approved Project. This would increase the overall number of proposed dwelling units over the entire TTM 31194 site (including Phases 1 to 3) from 486 to 571 dwelling units.

Table 2 Residential Dwelling Units

	Approved Project	Proposed Project	Net Change
Proposed Project (Phase 4 only)	161	259	98
TTM 31194 site (including Phases 1–3)	486	571	85*

*Note- The certified EIR for the approved project analyzed 486 residential lots; the proposed project consists of 571 residential lots. Due to tighter restrictions in water quality control (between when the original project was approved through now), new water quality basins were added in locations once approved for residential lots. The actual number of residential lots for the approved project decreased from 486 residential lots to 468 residential lots, for a reduction of 18 residential lots spread across all phases. Phase 4 decreased from 161 residential lots to 156 residential lots as shown under the latest tentative map project extension. The proposed project includes 259 residential lots for an increase of 103 residential lots.

Dwelling units under the Proposed Project would be developed as 50-foot x 80-foot lots with a minimum lot size of 4,000 square feet, and as 42-foot x 90-foot lots with a minimum lot size of 3,780 square feet.

3.3.2 Population Growth

As stated in the City of Menifee's General Plan EIR, SCAG's forecast growth projections anticipate Menifee's population to increase by 26,175 by 2035, that is, 28.1 percent of its 2020 population. Additionally, from 2020 to 2035 households are forecast to increase by 10,389, or 28.7 percent. As shown in Table 3, *Estimated Population Growth*, in accordance with the General Plan's future buildout projections, the Proposed Project would result in a population of approximately 803 residents in the 259 proposed dwelling units, and the TTM 31194 site would result in a population of approximately 1,770 residents of the 571 proposed dwelling units (including Phases 1 to 3). Thus, the Proposed Project would not result in substantial unplanned population growth either directly or indirectly, and population growth as a result of the Proposed Project would be within SCAG's forecast growth projections for the city.

Table 3. Estimated Population Growth

	Proposed Project (Phase 4 only)			TTM 31194 Site (including Phases 1 to 3)		
	Approved Project	Proposed Project	Net Change	Approved Project	Proposed Project	Net Change
Land Use Category	2.1-5 du/ac Residential (2.1-5R)	2.1-5 du/ac Residential (2.1-5R)	-	2.1-5 du/ac Residential (2.1-5R)	2.1-5 du/ac Residential (2.1-5R)	-
Average Household Size (per dwelling unit)	3.01	3.1	0.09	3.01	3.1	0.09
Proposed Units	161	259	98	486	571	85
Population	485[1]	803[2]	318	1,463[1]	1,770[2]	307

Source: City of Menifee, General Plan Housing Element 2008-2014 and Housing Element 2021-2029.
[1] Estimated population is based on the average household size of 3.01 persons per unit (Riverside County Ord. 460, Section 10.35).
[2]Estimated population is based on the average household size of 3.1 persons per unit (Housing Element 2021-2029).

3.4 PROJECT CONSTRUCTION

3.4.1 Project Phasing

The Approved Project will be completed in four phases, which would include Phase 4 (Proposed Project):

- **Phase 1**, which includes the northwestern, central, and southeastern portions of the subdivision, contains 109 residential lots and all major "backbone" infrastructure..
- **Phase 2**, which includes the southern and central portions of the subdivision, contains 109 residential lots.
- **Phase 3**, which includes the western portion of the subdivision, contains 94 residential lots.
- **Phase 4**, which includes the eastern portion of the subdivision. The Approved Project approved 161 residential lots in Phase 4, The Proposed Project contains 259 residential lots.

3.4.2 Construction Schedule

Construction of the Proposed Project is anticipated to start in December 2022 and finish in December 2027. It is anticipated that the first residential uses would be operational in January 2024. The construction would occur over approximately 60 months and include grading and excavation, trenching for site utilities and irrigation, building construction, architectural coatings, driveway and walkway construction, landscaping, and street connection improvements.

3. Proposed Project

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4. CEQA ANALYSIS

4.1 ENVIRONMENTAL ANALYSIS

The scope of the City's review of the Proposed Project is limited by provisions in CEQA and the State CEQA Guidelines. This review is limited to evaluating the environmental effects associated with the Proposed Project compared to the Approved Project found in the Certified EIR. This Addendum also reviews new information, if any, of substantial importance that was not known and could not have been known with the exercise of reasonable due diligence at the time the EIR was certified. This includes explanation of why the changes proposed for the Proposed Project would not result in any new significant impacts, a substantial increase in a previously identified significant impact, mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative, or mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Section 15164(b) of the CEQA Guidelines (Cal. Code of Regs., Title 14, Sections 15000 et. seq.) authorizes a lead agency to prepare an addendum to an EIR "if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred." Although State CEQA Guidelines Section 15164 does not stipulate the format or content of an addendum, the topical areas identified in the Certified EIR are the environmental factors evaluated in this Addendum. This comparative analysis provides the City with the factual basis for determining whether any changes in the Approved Project, any changes in circumstances, or any new information since the EIR was certified would require additional environmental review or preparation of a Subsequent EIR or Supplemental EIR.

Pursuant to Section 15162 of the State CEQA Guidelines, the City has determined, on the basis of substantial evidence in the light of the whole record, that the Proposed Project does not propose substantial changes to the Approved Project, no substantial changes in circumstances would require major revisions to the Certified EIR, and no new information of substantial importance has been revealed since the certification of EIR that would result in either new significant effects, an increase in the severity of previously analyzed significant effects, mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative, or mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

4. CEQA Analysis

4.1.1 Land Use Consistency

Approved Project Impact Analysis

The Approved Project would implement a new residential development that would be consistent with the types and uses that were allowed by the Sun City/Menifee Valley Area Plan's land use map, which designated the TTM 31194 site for Medium Density Residential (2–5 du/ac) and Rural Residential. The Certified EIR also analyzed the consistency of the Approved Project with the Riverside County General Plan, the Sun City/Menifee Valley Area Plan, the Multiple Species Habitat Conservation Program (MSHCP), the Community and Environmental Transportation Program, SCAG's Regional Comprehensive Plan and Guide and the Regional Transportation Plan, and the South California Air Quality Management District's (SCAQMD) Air Quality Management Plan (AQMP). The Approved Project was determined to be consistent with Riverside County's General Plan Land Use Element, Multipurpose Open Space Element, Safety Element, Noise Element, Housing Element, and Air Quality Element as well as all the above-mentioned planning documents. The Certified EIR therefore determined that the Approved Project is generally consistent with applicable land use plans, including the County's General Plan; therefore, impacts related to implementation of the Approved Project are less-than-significant and no mitigation is required.

Approved Project Mitigation Measures

No mitigation measures were required for the Approved Project regarding land use.

Proposed Project Impact Analysis

As described in Section 3.3, Phase 4 of the residential development would add approximately 98 additional dwelling units, for a total of 259 dwelling units, compared to 161 units proposed by the Approved Project. This would increase the overall number of proposed dwelling units from 486 to 571 (including Phases 1 to 3). However, the Proposed Project would now comply with standards and regulations of Menifee's General Plan, which currently designates the Project Site as 2.1-5 du/ac Residential (2.1-5 R), and it is zoned Planned Development District (PDO-5). The Proposed Project would still be consistent with the above-mentioned planning documents—the Community and Environmental Transportation Program, MSHCP, SCAG's 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy, and SCAQMD's AQMP.

In accordance with the General Plan's future buildout projections, the Proposed Project would result in a population of approximately 803 residents in 259 dwelling units, and the TTM 31194 site (including Phases 1 to 3) is anticipated to result in a population of approximately 1,770 residents in 571 dwelling units. Thus, the Proposed Project would not result in substantial unplanned population growth either directly or indirectly, and population growth as a result of the proposed project would be within SCAG's forecast growth projections for the city. There are no new potentially significant impacts associated with the Proposed Project; therefore, no new and/or refined mitigation measures are required for issues related to land use consistency.

Proposed Project Mitigation Measure

No mitigation measures are required for the Proposed Project regarding land use.

4.1.2 Aesthetics, Visual Quality, Light and Glare

Approved Project Impact Analysis

The Certified EIR determined that the Approved Project would change views of the TTM 31194 site from surrounding areas. Views would change from predominantly agricultural and undeveloped land to single-family residential and open space uses. The Approved Project was subject to the Countywide Design Standards and Guidelines for general residential design, residential lot design, residential street design, landscaping, neighborhood entry statements, street medians, reverse frontage treatments, medians, and parkways. Changes to community character were consistent with the County General Plan's Sun City/Menifee Valley Area Plan. The TTM 31194 site is in the Mt. Palomar Observatory Special Lighting District, which was established to control the effects of skyglow on the observatory. Implementation of the Approved Project would result in the introduction of new sources of lighting, including lights for residences, parks, and streetscapes, that could adversely affect the Palomar Observatory, resulting in a potentially significant impact. Therefore, the Certified EIR required implementation of Mitigation Measure 4.2-1 to ensure impacts from lighting would be reduced to less-than-significant.

Approved Project Mitigation Measure

4.2-1 The project shall comply with the applicable provisions of Riverside County Ordinance No. 655, which was established to regulate the use of certain light fixtures, and requires evidence of compliance with the lighting standards contained therein. All outdoor lighting systems shall comply with Ordinance No. 655.

Proposed Project Impact Analysis

The Proposed Project would be within the same footprint as the Approved Project; thus, impacts to the visual quality and character of the Project Site would not be substantially more severe as a result of the Proposed Project than as a result of the Approved Project. As with the Approved Project, implementation of the Proposed Project would result in the introduction of new sources of lighting, including lights for residences, parks, and streetscapes. However, the Proposed Project would be required to comply with the City of Menifee's Municipal Code Chapter 6.01, Dark Sky Ordinance, which is the same as County Ordinance No. 655 that was in effect at the time of Approved Project approval. The City's ordinance regulates light around Mt. Palomar by restricting the use of certain light fixtures and restricting emitting light rays into the night sky that would have a detrimental effect on astronomical observation and research (Menifee 2022). The revised Proposed Project Mitigation Measure 4.2.1 is substantively the same as Certified EIR Mitigation Measure 4.2.1 and will ensure impact from lighting from the Proposed Project will be reduced to less-than-significant.

Proposed Project Mitigation Measure

4.2-1 The project shall comply with the applicable provisions of ~~Riverside County Ordinance No. 655~~ City of Menifee's Municipal Code Chapter 6.01, Dark Sky Ordinance. The Dark Sy Ordinance is the same as County Ordinance No. 655, which was established to regulate the use of certain light fixtures, and requires evidence of compliance with the lighting standards

contained therein. All outdoor lighting systems shall comply with ~~Ordinance No. 655~~ the Dark Sky Ordinance.

4.1.3 Biological Resources

Approved Project Impact Analysis

The Certified EIR determined that the Approved Project would result in impacts to approximately 173.1 acres on-site (including fuel modification thinning) and approximately two acres off-site for off-site grading and infrastructure improvements. The loss of agricultural, disturbed, and ruderal habitat is not significant because this habitat is not sensitive. The loss of Riversidean sage scrub, northern mixed chaparral, and arroyo willow/mulefat scrub are considered significant to the extent that these vegetation communities support sensitive plant and wildlife species. Pursuant to MSHCP, the Approved Project's impacts to Riversidean sage scrub constituted a significant impact and required implementation of Mitigation Measure 4.3-1 to reduce potential impacts to less-than-significant levels.

No sensitive plant species and no narrow endemic species were identified in the general biological survey report compiled, and a majority of the TTM 31194 site is unsuitable for native special status plant species associated with vernal pool wetland or alkali playa due to the gentle sloping topography, long-term clearing, and deep plowing of the land for agriculture. Additionally, the TTM 31194 site is not identified in an area required to be surveyed pursuant to the MSHCP's "Protection of Narrow Endemic Plant Species" guidelines and "Additional Survey Needs and Procedures." Therefore, focused botanical surveys were not required for the TTM 31194 site, and any impacts to sensitive plant species, if present, were not regarded as significant. The project applicant was required to comply with Riverside County Ordinance No. 4.62.070, which requires payment of an MSHCP mitigation fee to assist in providing revenue to acquire and conserve lands necessary to implement the MSHCP.

Sensitive species observed on the site include California horned lark, Cooper's hawk, northern harrier, coastal California gnatcatcher, coast horned lizard, orange-throated whiptail, western whiptail, and black-tailed jackrabbit. According to the analysis in the biology report, the Approved Project did not significantly impact these species. Although burrowing owl was not observed on the site, it has the potential to move onto the site due to its migratory nature. Potential impacts to burrowing owl were considered significant, and mitigation was required. To reduce any potential impacts to other sensitive wildlife species, the project applicant was required to comply with Riverside County Ordinance No. 4.62.070. Additionally, the TTM 31194 site is within the "Habitat Conservation Plan [HCP] for the Stephen's Kangaroo Rat in Western Riverside County, California" (1993), and the applicant was required to mitigate development of land in the HCP by paying a per acre fee to the County. If construction activities took place between February 1 and August 31 and within 150 feet of suitable nesting locations, potential impacts could occur and a focused raptor survey was required prior to construction to determine there were active nests. Therefore, the Approved Project required implementation of Mitigation Measures 4.3-2 through 4.3-5 to reduce potential project impacts to a less-than-significant level.

The Certified EIR determined that, although some wildlife movement and foraging would occur in the native vegetation, the site did not provide a densely vegetated drainage and did not connect two larger tracts of native habitat. Therefore, the TTM 31194 site was not identified as a wildlife corridor, and project implementation would not result in disturbances to local wildlife movement.

The Approved Project directly impacted 34,512.6 square feet (0.79 acre) of state streambeds, of which 1,316 square feet (0.03 acre) are state wetlands and 18,748.6 square feet (0.43 acre) are federal jurisdictional drainages. Impacts to these jurisdictional wetlands and waters was considered significant and required implementation of Mitigation Measures 4.3-6 through 4.3-9 to reduce potential impacts to a less-than-significant level. The Approved Project proposed avoidance of 27,871.74 square feet (0.64 acres of state streambeds, all of which are considered state wetlands, and 18,919.3 square feet (0.43 acres of federal jurisdictional drainages. The Approved Project also proposed the creation of three wetland basins and jurisdictional drainages contiguous with the existing drainage and habitat and following the path of the historical blue-line stream. The created habitat and drainage would include approximately 53,400 square feet (1.2 acres) of state streambeds and wetlands; of this, approximately 22,090 square feet (0.51 acre) would be federal jurisdictional drainages. These avoidance and creation measures were proposed as a way to minimize impacts and provide a preferred alternative of quality habitat in a restored blue-line drainage.

Approved Project Mitigation Measures

Vegetation Communities

4.3-1 TTM No. 31194, Lot #503 (approximately 39.0 acres in the northeastern portion of the property) shall be preserved as open space and shall be covered by a conservation easement or other mechanism to ensure permanent preservation, with allowance for required maintenance of fuel modification zones. The conservation easement area shall be shown on the Final Map.

Sensitive Wildlife Species

4.3-2 Thirty days prior to grading, a qualified biologist shall make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report to be reviewed and accepted by the County of Riverside. If the species is determined to be present, and the MSHCP's stated objectives 1 – 4 for burrowing owl have not yet been met, mitigation shall be required in compliance with the MSHCP, Appendix E which states:

a. If the site contains or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and surrounding area supports less than 3 pairs of burrowing owls, then the on-site burrowing owls shall be passively or actively relocated following accepted protocols.

b. If the site (including adjacent areas) supports 3 or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs shall be conserved on-site.

4.3-3 Prior to issuance of grading permits, the applicant shall be required to pay Local Development Mitigation Fees (per County Ordinance No. 4.62.070) for implementation of the MSHCP.

4. CEQA Analysis

4.3-4 Prior to issuance of grading permits, the applicant shall pay fees in accordance with the USFWS-approved HCP, to mitigate the project's potentially significant impacts to the Stephens' kangaroo rat.

4.3-5 If construction activities occur between February 1 and August 31 and within 150 feet of suitable nesting locations, a focused raptor survey will be required prior to issuance of grading permits. If active nests are located within the portion of the site to be disturbed or within 150 feet of the area to be disturbed, measures shall be initiated to avoid any impacts to nesting raptors. Measures to avoid impacts will include identifying the location and creating a buffer zone around the tree within which impacts will be avoided until the juveniles have fledged.

a. The white-tailed kite is "fully-protected" by the California Department of Fish and Game. If this species is documented as nesting on the TTM 31194 site during the raptor survey, or it is determined this species will be significantly impacted by development a 2080 permit for "take" shall be required from the CDFG.

Jurisdictional Wetlands and Waters

4.3-6 Prior to the issuance of grading permits, the applicant shall submit documentation to the County of Riverside verifying that the necessary permits required by the U.S. Army Corps of Engineers (ACOE), California Department of Fish and Game (CDFG) and Regional Water Quality Control Board (RWQCB) have been obtained. The ACOE has a no net loss policy which requires that any unavoidable impacts to wetland values and functions be replaced. In addition, the RWQCB will add restrictions to control runoff from the site, require on the site treatment of runoff to improve water quality, and impose Best Management Practices on the construction. It is anticipated that the following measures or similar measures as approved by the ACOE, CDFG, and RWQCB would reduce impacts to ACOE and CDFG jurisdictional areas to a level less-than-significant:

a. On or off-site replacement of ACOE jurisdictional waters and wetlands at a ratio no less than 1:1;

b. On or off-site replacement of CDFG jurisdictional streambed and associated riparian habitat at a ratio no less than 1:1; and/or

c. Incorporation of design features into the proposed project that will avoid biological impacts to off-site blue-line streams that ultimately end up in the Railroad Canyon Reservoir (Canyon Lake).

4.3-7 Individual lot fencing shall be used to restrict access to the on-site wetland areas. Back yard gates from individual residential lots that open onto the wetland area shall be prohibited. Fencing locations and materials shall be shown on the Final Map and approved by the County's Environmental Programs Department (EPD) prior to issuance of building permits. Required fencing shall be installed prior to issuance of occupancy permits.

4.3-8 Night lighting during and after project construction shall be directed away from onsite wetland areas and, except for safety and other requirements, lighting shall be limited from the boundaries of onsite wetland areas. In the event that lighting in an area adjacent to the wetland area is necessary, a shield shall be incorporated in project designs to ensure ambient lighting in the wetland area is not increased. Lighting plans shall be approved by the County prior to issuance of building permits. Lighting restrictions and the reasons for such restrictions shall be included in the project's CC&Rs.

4.3-9 The landscape plans for the project in areas adjacent or tributary to wetland areas shall not include those species listed in the MSHCP as "Plants That Should Be Avoided Adjacent To The MSHCP Conservation Area". The County of Riverside Planning Department shall review and approve all plant material for the project, prior to issuance of building permits. Information regarding the importance of avoiding the listed plants, even in front and backyard landscaping, shall be included in sales literature distributed to homeowners. The list of restricted plant materials and the reasons for such restrictions shall be listed in the project's CC&Rs.

Proposed Project Impact Analysis

The following biological resources were identified in the Updated Biological Resources Assessment (L&L 2021a) and Updated Jurisdictional Delineation (L&L 2022a) that were prepared for the Proposed Project (see Appendix C).

MSHCP

The Project Site is located within the area covered by the MSHCP but is not within the Criteria Area. There is one area of Public/Quasi-Public (PQP) Conserved Lands approximately 0.68 mile north-northeast of the Project Site (Ringing Rock Archaeological Site). There are no other PQP or MSHCP Conserved Lands within a mile of the site. Therefore, the Project Site is not within or near any MSHCP Core Areas or Linkages.

Sensitive Vegetation Communities

The Project Site is composed of agricultural lands and disturbed/ruderal areas, California buckwheat scrub, chamise chaparral, arroyo willow thickets, and mulefat thickets. Arroyo willow thickets and mulefat thickets are riparian vegetation communities and arroyo willow thicket is considered sensitive. The majority of arroyo willow thicket will be retained in the Avoidance Area.

Listed and Special Status Plant Species

There are no state or federally listed plants within the Project Site and it is not within U.S. Fish and Wildlife Service–designated critical habitat for any listed plant species. Two special status plant species were observed on the Project Site, long-spined spine flower and southern California black walnut, which are both covered species under the MSHCP and considered adequately conserved.

4. CEQA Analysis

Trees

There is a single immature coast live oak tree on the Project Site within the riparian area, in addition to other native and nonnative trees. The City may regulate removal or replacement of trees, and a tree survey may be required.

Listed and Fully Protected Wildlife Species

Two listed or fully protected wildlife species are on the Project Site—coastal California gnatcatcher and white-tailed kite. Both are covered species under the MSHCP and considered adequately conserved.

All observations of coastal California gnatcatchers on the Project Site were in the California buckwheat scrub habitat in the northeastern portion of the site. Under Mitigation Measure 4.3-1, this northeastern portion would be preserved as open space and covered by a conservation easement or similar mechanism. The Proposed Project would schedule construction activities outside the nesting season and/or conduct preconstruction nesting bird clearance surveys, establish avoidance buffers around any active nests, and monitor active nest sites during construction activities, as recommended.

Two white-tailed kites were observed on the Project Site in 2005 and one in 2011. No kites have been observed during more recent surveys. Although this species may forage on the Project Site and potentially suitable nesting habitat is present, no nesting has been observed. Under Mitigation Measure 4.3-3, if construction activities occur between February 1 and August 31 and within 150 feet of suitable nesting locations, a focused raptor survey will be required prior to issuance of grading permits. If active nests are within the portion of the site to be disturbed or within 150 feet of the area to be disturbed, measures shall be initiated to avoid any impacts to nesting raptors, including avoidance buffers around active nests. Under this mitigation measure, if white-tailed kite nesting is found on the Project Site, an incidental take permit from California Department of Fish and Wildlife (CDFW) is required.

Special Status Wildlife Species

The Updated Biological Resources Assessment identified 19 special status wildlife species on the Project Site: orange-throated whiptail, coastal (western) whiptail, coast horned lizard, Cooper's hawk, southern California rufous-crowned sparrow, great egret, great blue heron (fly over), Bell's sage sparrow, burrowing owl, Costa's hummingbird, wrentit, northern harrier, Nuttall's woodpecker, California horned lark, loggerhead shrike, rufous hummingbird, Lawrence's goldfinch, California thrasher, and San Diego black-tailed jackrabbit.

The species covered under the MSHCP are considered adequately conserved. Burrowing owl is discussed below. Species not covered under the MSHCP are great egret, Costa's hummingbird, wrentit, Nuttall's woodpecker, rufous hummingbird, Lawrence's goldfinch, and California thrasher. Scheduling Project construction outside the nesting season or conducting preconstruction nesting bird clearance surveys and establishing avoidance buffers around any active nests are recommended.

Five additional special status wildlife species have not been observed on the Project Site but have a low to moderate potential to occur. These species are Crotch's bumblebee, southern California legless lizard, Dulzura pocket mouse, northwestern San Diego pocket mouse, and western mastiff bat (foraging). Northwestern San

Diego pocket mouse is covered under the MSHCP and considered adequately conserved. The remaining four species are not covered under the MSHCP.

Crotch's bumblebee was previously a candidate for state listing, but in November 2020 the Sacramento Superior Court ruled that insects are not eligible for listing under the California Endangered Species Act. The California Fish and Game Commission filed an intent to appeal this decision in February 2021. The status of this species may be affected by subsequent litigation or changes to regulations. If Crotch's bumblebee becomes a listed or candidate species, focused surveys and incidental take permitting may be required.

Burrowing Owl

One adult burrowing owl and an occupied burrow were observed on the Project Site. Because suitable habitat is present, the MSHCP requires a preconstruction clearance survey for burrowing owl within 30 days prior to the start of site disturbance. If burrowing owls are found on-site at that time, additional mitigation is required under the MSHCP and Mitigation Measure 4.3-2. The project applicant is required to comply with Menifee Municipal Code Section 8.27.040 which requires payment of an MSHCP mitigation fee to assist in providing revenue to acquire and conserve lands necessary to implement the MSHCP.

Nesting Birds

There is habitat suitable for nesting birds (including raptors) within and adjacent to the site. Nesting birds may utilize trees, shrubs, other vegetation, and open ground on and adjacent to the site. Nesting birds are protected under state and federal laws. Project activities, including initial vegetation trimming/clearing, tree trimming/removal, ground disturbance, etc. should be avoided during the nesting season (generally February 1 to August 31). If the nesting season cannot be avoided, a nesting bird clearance survey is recommended within three days prior to the start of Project construction activities within the nesting season. If active nests are present, avoidance of nest sites is required, and a buffer of 300 to 500 feet (or as determined by a biologist) is recommended until a biologist has verified that juvenile birds are no longer dependent on the nest or the nest has otherwise become inactive. An active nest is defined as a nest with eggs, chicks, or dependent juveniles, or a nest actively being constructed or utilized for reproduction.

Wildlife Corridors

The Project Site is largely surrounded by scattered existing development, and there is no connectivity between the Project Site and conserved lands to the east and southwest. Although there may be limited local movement of wildlife on and across the Project Site, it is not within or adjacent to a wildlife corridor or potential corridor.

Jurisdictional Waters/Wetlands and MSHCP Riparian/Riverine and Vernal Pool Habitat

An ephemeral drainage with scattered riparian vegetation is present on the Project Site and mapped as a blue-line stream by the U.S. Geological Survey. The jurisdictional areas identified on the Project Site were updated as 18,814 square feet (0.43 acre) of CDFW unvegetated state streambed and 40,451 square feet (0.93 acre) of CDFW state wetland. The survey also identified 4,397 square feet (0.10 acre) of U.S. Army Corps of Engineers (USACE) waters of the U.S. (WoUS), none of which is USACE federal wetland. A total of 59,265 square feet (1.361 acres) of Western Riverside County MSHCP Riparian/Riverine habitat was identified in the Project Area.

4. CEQA Analysis

The Proposed Project would impact approximately 9,541 square feet (0.22 acre) of CDFW state streambed, 5,702 square feet (0.13 acre) of CDFW state wetland, and 1,301 square feet (0.03 acre) of USACE WoUS. Further, the Proposed Project would retain 9,273 square feet (0.21 acre) of state streambed and 34,749 square feet (0.80 acre) of state wetland, including 3,096 square feet (0.07 acre) of WoUS by incorporating these areas on-site within a Compatible Use Area.

Regulatory permits from the USACE, Regional Water Quality Control Board, and CDFW will be required for impacts to jurisdictional areas. A Determination of Biologically Equivalent or Superior Preservation (DBESP) has been prepared to evaluate impacts to MSHCP riparian/riverine habitat (see Appendix C). Mitigation Measure 4.3-5 also requires on- or off-site replacement of CDFW and federal jurisdictional waters and wetlands at a ratio of no less than 1:1 and incorporation of design features that would avoid biological impacts to off-site blue-line streams that flow to Canyon Lake. All jurisdictional areas on-site will either be impacted by Project development or incorporated into the Avoidance Area. Monitoring of Project activities adjacent to the Avoidance Area is recommended.

Pools or depressions characteristic of vernal habitat were not observed on the Project Site, and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the Project Site.

Proposed Project Mitigation Measures

The following mitigation measures from the Certified EIR have been revised to reflect the change in lead agency from the County to the City or changes in agency names. The Proposed Project would have less-than-significant impacts on biological resources after mitigation.

Vegetation Communities

4.3-1 TTM No. 31194-4 Lot E, (formerly Lot #503 of TTM 31194) (approximately 39.0 acres in the northeastern portion of the property) shall be preserved as open space and shall be covered by a conservation easement or other mechanism to ensure permanent preservation, with allowance for required maintenance of fuel modification zones. The conservation easement area shall be shown on the Final Map.

Sensitive Wildlife Species

4.3-2 Thirty days prior to grading, a qualified biologist shall make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report to be reviewed and accepted by the ~~County of Riverside~~ City of Menifee. If the species is determined to be present, and the MSHCP's stated objectives 1 – 4 for burrowing owl have not yet been met, mitigation shall be required in compliance with the MSHCP, Appendix C which states:

a. If the site contains or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and surrounding area supports less than 3 pairs of burrowing owls, then the on-site burrowing owls shall be passively or actively relocated following accepted protocols.

b. If the site (including adjacent areas) supports 3 or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs shall be conserved on-site.

4.3-3 Prior to issuance of building permits, the applicant shall be required to pay Local Development Mitigation Fees (per Menifee Municipal Code section 8.27.040) for implementation of the MSHCP.

4.3-4 Prior to issuance of grading permits, the applicant shall pay fees in accordance with the USFWS-approved HCP, to mitigate the project's potentially significant impacts to the Stephens' kangaroo rat.

4.3-5 If construction activities occur between February 1 and August 31 and within 150 feet of suitable nesting locations, a focused raptor survey will be required prior to issuance of grading permits. If active nests are located within the portion of the site to be disturbed or within 150 feet of the area to be disturbed, measures shall be initiated to avoid any impacts to nesting raptors. Measures to avoid impacts will include identifying the location and creating a buffer zone around the tree within which impacts will be avoided until the juveniles have fledged.

a. The white-tailed kite is "fully-protected" by the California Department of Fish and ~~Game~~Wildlife. If this species is documented as nesting on the Project Site during the raptor survey, or it is determined this species will be significantly impacted by development a 2080 permit for "take" shall be required from the ~~CDFG~~CDFW.

Jurisdictional Wetlands and Waters

4.3-6 Prior to the issuance of grading permits, the applicant shall submit documentation to the City of Menifee verifying that the necessary permits required by the U.S. Army Corps of Engineers (~~ACOE~~USACE), California Department of Fish and ~~Game~~Wildlife (~~CDFG~~CDFW) and Regional Water Quality Control Board (RWQCB) have been obtained. The ~~ACOE~~USACE has a no net loss policy which requires that any unavoidable impacts to wetland values and functions be replaced. In addition, the RWQCB will add restrictions to control runoff from the site, require on the site treatment of runoff to improve water quality, and impose Best Management Practices on the construction. It is anticipated that the following measures or similar measures as approved by the ~~ACOE~~USACE, ~~CDFG~~CDFW, and RWQCB would reduce impacts to ~~ACOE~~USACE and ~~CDFG~~CDFW jurisdictional areas to a level less-than-significant:

a. On or off-site replacement of ~~ACOE~~USACE jurisdictional waters and wetlands at a ratio no less than 1:1;

b. On- or off-site replacement of ~~CDFG~~CDFW jurisdictional streambed and associated riparian habitat at a ratio no less than 1:1; and/or

c. Incorporation of design features into the proposed project that will avoid biological impacts to off-site blue-line streams that ultimately end up in the Railroad Canyon Reservoir (Canyon Lake).

4.3-7 Individual lot fencing shall be used to restrict access to the on-site wetland areas. Back yard gates from individual residential lots that open onto the wetland area shall be prohibited. Fencing locations and materials shall be shown on the Final Map and approved by the County's Environmental Programs Department (EPD) prior to issuance of building permits. Required fencing shall be installed prior to issuance of occupancy permits.

4.3-8 Night lighting during and after project construction shall be directed away from onsite wetland areas and, except for safety and other requirements, lighting shall be limited from the boundaries of onsite wetland areas. In the event that lighting in an area adjacent to the wetland area is necessary, a shield shall be incorporated in project designs to ensure ambient lighting in the wetland area is not increased. Lighting plans shall be approved by the City prior to issuance of building permits. Lighting restrictions and the reasons for such restrictions shall be included in the project's CC&Rs.

4.3-9 The landscape plans for the project in areas adjacent or tributary to wetland areas shall not include those species listed in the MSHCP as "Plants That Should Be Avoided Adjacent To The MSHCP Conservation Area". The City Planning Department shall review and approve all plant material for the project, prior to issuance of building permits. Information regarding the importance of avoiding the listed plants, even in front and backyard landscaping, shall be included in sales literature distributed to homeowners. The list of restricted plant materials and the reasons for such restrictions shall be listed in the project's CC&Rs.

4.1.4 Archaeological and Paleontological Resources

Approved Project Impact Analysis

The Certified EIR determined that there are no identified historic or prehistoric sites on the TTM 31194 site; however, archaeologically sensitive sites have been identified in its vicinity, and the potential for archeologically sensitive sites occurring on the TTM 31194 site exists. Therefore, the potential for disturbance to undiscovered sites during grading was considered potentially significant and required implementation of Mitigation Measures 4.4-1 through 4.4-9 to reduce potential impacts to less-than-significant.

Additionally, portions of the TTM 31194 site contain Quaternary alluvium (Qofa), which has a high potential for yielding fossils. Therefore, the potential for disturbance to paleontological resources during grading in older alluvium was considered potentially significant and required implementation of Mitigation Measures 4.4-10 through 4.4-18 to reduce potential impacts to less-than-significant.

Approved Project Mitigation Measures:

Archaeological Resources

4.4-1 Prior to any clearing, grubbing and/or earth moving activities, a qualified archaeologist shall be retained by the developer. The potential for discovery of archaeological resources on the site has been indicated as medium to high; therefore, consultation with the culturally affiliated Luiseño Tribe(s) is required. A pre-grading meeting between the archaeologist, a Native American observer, and the excavation and grading contractor shall take place to ensure an understanding of the mitigation measures required during construction.

4.4-2 (A) Prior to issuance of a grading permit, the archaeologist shall develop a mitigation plan and a discovery clause/treatment plan, which shall include mitigation monitoring to be implemented during earthmoving on the TTM 31194 site. The treatment plan shall be developed in consultation with the culturally affiliated Luiseño Tribe(s) and shall account for treatment of any archaeological remains and associated data uncovered by brushing, grubbing, or earthmoving.

(B) The project applicant shall enter into a pre-excavation agreement with the culturally affiliated Luiseño Tribe(s). The agreement shall document archeological monitoring requirements and specify the disposition of any significant resources discovered during monitoring.

4.4-3 Prior to the issuance of a grading permit and again if necessary during the development of the final project mitigation report, the project proponent shall inquire if the Pechanga Tribe has developed a standard retrievable archival system for cultural materials. If such system is in place, the Pechanga Tribe shall be given preference in housing any collection. The landowner shall relinquish ownership of all cultural resources, including all Luiseno cultural sacred items, burial goods and all archaeological artifacts that are found on the TTM 31194 site, to the culturally affiliated Luiseño Tribe(s) for proper treatment and disposition.

4.4-4 Archaeological and tribal monitoring shall be conducted on a full-time basis for all grading and ground disturbing activities, including archaeological testing, until the project archaeologist in consultation with the culturally affiliated Luiseño Tribe(s) and the County of Riverside determines that resources are not likely to be encountered.

4.4-5 If archaeological remains are found by the archaeological monitor, earthmoving shall be diverted temporarily around the deposits until they have been evaluated, recorded, excavated, and/or recovered as necessary. Earthmoving shall be allowed to proceed through the site when the archaeological supervisor, in consultation with the culturally affiliated Luiseño Tribe(s) and the County of Riverside, determines the artifacts are recovered and/or the site is mitigated to the extent necessary.

4.4-6 If possible human remains are encountered during any earthmoving activities, all work shall stop in the area in which the find(s) are present, and the Riverside County Coroner must be

notified. State law dictates that the Native American Heritage Commission (NAHC) shall be notified in the event that remains are determined to be human and of Native American decent, in accordance with California Public Resources Code Section 5097.98.

4.4-7 If a previously unknown site is encountered and it requires additional mitigation, a plan or proposal shall be prepared by the archaeologist, in consultation with the culturally affiliated Luiseño Tribe(s) and County of Riverside, outlining the plan of action that needs to be implemented to mitigate the new site.

4.4-8 Any recovered archaeological resources shall be identified, recorded, mapped and artifacts catalogued as required by standard archaeological practices. Examination by an archaeological specialist shall be included where necessary, dependent upon the artifacts, features or sites that are encountered. Specialists shall identify, date, and/or determine significance potential.

4.4-9 A final report of findings shall be prepared by the archaeologist for submission to the Eastern Information Center and the County of Riverside. The report shall describe parcel history, summarize field and laboratory methods used, if applicable, and include any testing or special analysis information conducted to support the findings.

Paleontological Resources

4.4-10 Prior to any earth moving in areas containing older alluvium, a vertebrate paleontologist retained by the project proponent and approved by the County of Riverside shall develop a storage agreement with the LACM Vertebrate Paleontology Section, San Bernardino County Museum, or another acceptable museum repository to allow for the permanent storage and maintenance of any fossil remains recovered in the project area as a result of the monitoring program, and for the archiving of associated specimen data and corresponding geologic and geographic site data at the museum repository.

4.4-11 The paleontologist shall develop a mitigation plan and a discovery clause/treatment plan that, when implemented during earthmoving activities in the project area shall allow for the recovery and subsequent treatment of any fossil remains and associated specimen and site data uncovered by these activities.

4.4-12 The paleontologist and a palaeontologic construction monitor shall attend a pre-grade meeting to explain the monitoring program to grading contractor staff and to develop procedures and lines of communication to be implemented if fossil remains are uncovered by earthmoving activities, particularly when a monitor may not be on-site.

4.4-13 Palaeontologic monitoring of earthmoving activities shall be conducted on a full-time basis by the monitor during all earthmoving activities due to the exposure of sensitive strata. Earthmoving activities in areas of the project area where previously undisturbed strata will be buried but not otherwise disturbed shall not be monitored. The supervising paleontologist shall have the authority to reduce monitoring once he determines the probability of encountering fossils has dropped below an acceptable level.

4.4-14 If the monitor finds fossil remains, earthmoving activities shall be diverted temporarily around the fossil site until the remains have been recovered and these activities are allowed to proceed through the site by the monitor.

4.4-15 If fossil remains are encountered by earthmoving activities when the monitor is not on site, these activities shall be diverted around the fossil site and the monitor called to the site immediately to recover the remains.

4.4-16 If fossil remains are found, an appropriate amount of fossiliferous rock shall be recovered from the fossil site and processed to allow for the recovery of smaller fossil remains. Test samples may be recovered from other sampling sites in the rock unit.

4.4-17 Any recovered fossil remains shall be prepared to the point of identification and identified to the lowest taxonomic level possible by knowledgeable paleontologists. The remains shall then be curated (assigned and labeled with museum repository fossil specimen numbers and corresponding fossil site numbers, as appropriate; placed in specimen trays and, if necessary, vials with completed specimen data cards) and catalogued, and associated specimen data and corresponding geologic and geographic site data shall be archived (specimen and site numbers and corresponding data entered into appropriate museum repository catalogs and computerized data bases) at the museum repository by a laboratory technician. The remains shall then be accessioned into the museum repository fossil collection, where they shall be permanently stored, maintained, and, along with associated specimen and site data, made available for future study by qualified scientific investigators.

4.4-18 A final report of results and findings shall be prepared by the paleontologist for submission to the County of Riverside and the museum repository following accessioning of the fossil collection into the museum repository fossil collection. The report shall describe the geology and stratigraphy parcel, summarize field and laboratory methods used, include a faunal list and an inventory of catalogued fossil specimens, evaluate the scientific importance of the specimens, and discuss the relationship of any newly recorded fossil site in the parcel to relevant fossil sites previously recorded from the fossil-bearing rock unit in the parcel vicinity and from correlative rock units in other regions.

Proposed Project Impact Analysis

The Proposed Project would be in the same footprint as the Approved Project; thus, potential impacts to archaeological and paleontological resources would still be present with the implementation of the Proposed Project.

According to the Phase I cultural resources assessment prepared for the Proposed Project (see Appendix D), six new cultural resources were identified in the Project Area. These include one isolated prehistoric artifact (RLCC-01-ISO), three bedrock milling sites (RLCC-02, -04, and -05), a concrete gallinaceous guzzler (RLCC-06H), and a hand-hewn wood-post and barbed-wire fence line (RLCC-07H). Isolate RLCC-01-ISO and fence line RLCC-07H are recommended not eligible for the California Register of Historical Resources (CRHR). No further consideration of RLCC-07H is required during Project planning. However, prehistoric isolated finds

4. CEQA Analysis

like RLCC-01-ISO that do not qualify as historical resources under CEQA may have cultural significance to local Native American tribes; therefore, efforts should be made to avoid direct impacts that may result in damage to or destruction of these isolated resources. The three bedrock milling sites (RLCC-02, -04, and -05) are recommended not eligible for individual listing on the CRHR, but collectively, their association with Native American settlement and subsistence activities contributes to the historical significance of the potential Christensen Webb village complex. Furthermore, viewshed and auditory analysis, limited subsurface exploration, and documentation of these sites have the potential to generate important information about prehistory; therefore, these sites, collectively, also contribute to the significance of the potential district area. Thus, RLCC-02, -04, and -05 are considered historical resources for the purposes of CEQA. In its current state, gallinaceous guzzler RLCC-06H does not appear to have sufficient integrity to convey historical significance because of its distinctive character of type, period, and method of construction. Therefore, RLCC-06H does not appear to qualify for the CRHR and is not considered a historical resource under CEQA. However, a reassessment of its integrity and potential significance may be warranted during Project construction should its apron (a shallow half-circle shaped catchment basin) and other character-defining features be found intact (L&L 2022b).

Additionally, according to the Updated Record Search and Phase I Paleontological Resources Inventory prepared for the Proposed Project, the palaeontologic resources record searches did not identify any previously recorded paleontological localities on or near the Project Site. Previously, the entire site was surveyed for palaeontologic resources, and no fossil materials were identified on-site. The potential for destruction of paleontological resources during surficial earthmoving during construction is high in rocks of Quaternary, old alluvial fan deposits, arenaceous rocks (deposits that are composed of sand grains or have a sandy texture), because significant paleontological resources have been found in similar deposits. There is no potential for paleontological resources in the granitoid rocks of the Southern California batholith. Therefore, due to this potential, any excavation below five feet in depth should be monitored by a qualified paleontologist (L&L 2021b).

Although the Proposed Project would require the implementation of revised and updated mitigation measures, they would not be considerably different than the mitigation measures analyzed in the Certified EIR.

Proposed Project Mitigation Measures:

The mitigation measures below have been revised or updated to ensure that the Proposed Project would result in less-than-significant impacts on archaeological and paleontological resources.

Archaeological Resources

4.4-1 Prior to any clearing, grubbing and/or earthmoving activities, a qualified archaeologist shall be retained by the developer. The potential for discovery of archaeological resources on the site has been indicated as medium to high; therefore, consultation with the culturally affiliated Luiseño Tribe(s) is required. A pre-grading meeting between the archaeologist, a Native American observer, and the excavation and grading contractor shall take place to ensure an understanding of the mitigation measures required during construction.

4.4-2 (A)Prior to issuance of a grading permit, the archaeologist shall develop a mitigation plan and a discovery clause/treatment plan, which shall include mitigation monitoring to be implemented during earthmoving on the Project Site. The treatment plan shall be developed in consultation with the culturally affiliated Luiseño Tribe(s) and shall account for treatment of any archaeological remains and associated data uncovered by brushing, grubbing, or earthmoving.

The mitigation and discovery/treatment plan should include a discussion of key personnel and their specific roles and responsibilities; archaeological monitoring methods; controlled excavation and/or destruction methods; environmentally sensitive areas procedures; preconstruction field surveys to identify known and unknown cultural resources; a discussion of archaeological resource classes that may be encountered during construction; and protocols for identifying, evaluating, treating, and curating archaeological resources that may be encountered. The plan should also include the following attachments: an Environmentally Sensitive Area Action Plan to preserve known bedrock milling features in place; cultural resource sensitivity training for construction personnel (i.e., Worker Environmental Awareness Program); methods for documenting bedrock milling features through close range photogrammetric documentation and viewshed analysis (i.e., direct line of sight and 180-degree viewsheds); and methods of relocating bedrock milling features to the nearest dedicated open space where they will be preserved in perpetuity. The plan will be prepared in consultation with culturally affiliated Luiseño Tribe(s).

(B) The project applicant shall enter into a pre-excavation agreement with the culturally affiliated Luiseño Tribe(s). The agreement shall document archaeological monitoring requirements and specific the disposition of any significant resources discovered during monitoring.

4.4-3 ~~Prior to the issuance of a grading permit and again if necessary during the development of the final project mitigation report, the project proponent shall inquire if the Pechanga Tribe has developed a standard retrievable archival system for cultural materials. If such system is in place, the Pechanga Tribe shall be given preference in housing any collection.~~ The landowner shall relinquish ownership of all cultural resources, including all Luiseño cultural sacred items, burial goods, and all archaeological artifacts that are found on the Project Site, to the culturally affiliated Luiseño Tribe(s) for proper treatment and disposition.

The Project proponent will hire a qualified archaeologist that meets Secretary of Interior Standards to oversee the surface collection of isolated prehistoric artifact RLCC-01-ISO. The field work shall be completed by an archaeologist and Native American monitor(s) on behalf of the culturally affiliated Luiseño Tribe(s).

4.4-4 Archaeological and tribal monitoring shall be conducted on a full-time basis for all grading and ground-disturbing activities, including archaeological testing, until the project archaeologist in consultation with the culturally affiliated Luiseño Tribe(s) and the County of Riverside determines that resources are not likely to be encountered.

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4.4-5 If archaeological remains are found by the archaeological monitor, earthmoving shall be diverted temporarily around the deposits until they have been evaluated, recorded, excavated, and/or recovered as necessary. Earthmoving shall be allowed to proceed through the site when the archaeological supervisor, in consultation with the culturally affiliated Luiseño Tribe(s) and the ~~County of Riverside~~ City of Menifee, determines the artifacts are recovered and/or the site is mitigated to the extent necessary.

4.4-6 If possible human remains are encountered during any earthmoving activities, all work shall stop in the area in which the find(s) are present, and the Riverside County Coroner must be notified. State law dictates that the Native American Heritage Commission (NAHC) shall be notified in the event that remains are determined to be human and of Native American descent, in accordance with California Public Resources Code Section 5097.98.

4.4-7 If a previously unknown site is encountered and it requires additional mitigation, a plan or proposal shall be prepared by the archaeologist, in consultation with the culturally affiliated Luiseño Tribe(s) and ~~County of Riverside~~ City of Menifee, outlining the plan of action that needs to be implemented to mitigate the new site.

4.4-8 Any recovered archaeological resources shall be identified, recorded, mapped, and artifact catalogued as required by standard archaeological practices. Examination by an archaeological specialist shall be included where necessary, dependent upon the artifacts, features or sites that are encountered. Specialists shall identify, date, and/or determine significance potential.

4.4-9 A final report of findings shall be prepared by the archaeologist for submission to the Eastern Information Center and the ~~County of Riverside~~ City of Menifee. The report shall describe parcel history, summarize field and laboratory methods used, if applicable, and include any testing or special analysis information conducted to support the findings.

The draft archaeological monitoring report will, at a minimum, present the results of monitoring field work, including enforcement of Environmentally Sensitive Areas; the Worker Environmental Awareness Program; efforts to relocate bedrock milling features; copies of daily monitoring logs; and appended photogrammetric documentation and viewshed analysis of bedrock milling features. If archaeological resources are discovered while implementing the monitoring program, the final monitoring report may also report on the results of lab analysis and special studies, and document the final treatment and disposition of the artifacts. The archaeological monitoring report will be completed in consultation with the culturally affiliated Luiseño Tribe(s). The Project proponent is responsible for completing a final monitoring report that addresses comments from the lead agency, Project proponent, and/or consulting tribes. Final reports must be submitted to the lead agency, Project proponent, consulting tribes, and the Eastern Information Center at the University of California, Riverside.

Paleontological Resources

~~4.4-10 Prior to any earth moving in areas containing older alluvium, a vertebrate paleontologist retained by the project proponent and approved by the County of Riverside shall develop a~~

~~storage agreement with the LACM Vertebrate Paleontology Section, San Bernardino County Museum, or another acceptable museum repository to allow for the permanent storage and maintenance of any fossil remains recovered in the project area as a result of the monitoring program, and for the archiving of associated specimen data and corresponding geologic and geographic site data at the museum repository.~~

~~4.4-11 The paleontologist shall develop a mitigation plan and a discovery clause/treatment plan that, when implemented during earthmoving activities in the project area shall allow for the recovery and subsequent treatment of any fossil remains and associated specimen and site data uncovered by these activities.~~

~~4.4-12 The paleontologist and a palaeontologic construction monitor shall attend a pre-grade meeting to explain the monitoring program to grading contractor staff and to develop procedures and lines of communication to be implemented if fossil remains are uncovered by earthmoving activities, particularly when a monitor may not be on-site.~~

~~4.4-13 Palaeontologic monitoring of earthmoving activities shall be conducted on a full-time basis by the monitor during all earthmoving activities due to the exposure of sensitive strata. Earthmoving activities in areas of the project area where previously undisturbed strata will be buried but not otherwise disturbed shall not be monitored. The supervising paleontologist shall have the authority to reduce monitoring once he determines the probability of encountering fossils has dropped below an acceptable level.~~

~~4.4-14 If the monitor finds fossil remains, earthmoving activities shall be diverted temporarily around the fossil site until the remains have been recovered and these activities are allowed to proceed through the site by the monitor.~~

~~4.4-15 If fossil remains are encountered by earthmoving activities when the monitor is not on site, these activities shall be diverted around the fossil site and the monitor called to the site immediately to recover the remains.~~

~~4.4-16 If fossil remains are found, an appropriate amount of fossiliferous rock shall be recovered from the fossil site and processed to allow for the recovery of smaller fossil remains. Test samples may be recovered from other sampling sites in the rock unit.~~

~~4.4-17 Any recovered fossil remains shall be prepared to the point of identification and identified to the lowest taxonomic level possible by knowledgeable paleontologists. The remains shall then be curated (assigned and labeled with museum repository fossil specimen numbers and corresponding fossil site numbers, as appropriate; placed in specimen trays and, if necessary, vials with completed specimen data cards) and catalogued, and associated specimen data and corresponding geologic and geographic site data shall be archived (specimen and site numbers and corresponding data entered into appropriate museum repository catalogs and computerized data bases) at the museum repository by a laboratory technician. The remains shall then be accessioned into the museum repository fossil collection, where they shall be~~

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~~permanently stored, maintained, and, along with associated specimen and site data, made available for future study by qualified scientific investigators.~~

~~4.4-18 A final report of results and findings shall be prepared by the paleontologist for submission to the County of Riverside and the museum repository following accessioning of the fossil collection into the museum repository fossil collection. The report shall describe the geology and stratigraphy parcel, summarize field and laboratory methods used, include a faunal list and an inventory of catalogued fossil specimens, evaluate the scientific importance of the specimens, and discuss the relationship of any newly recorded fossil site in the parcel to relevant fossil sites previously recorded from the fossil bearing rock unit in the parcel vicinity and from correlative rock units in other regions.~~

4.4-10 **Review Geotechnical Report Data.** In conjunction with the final design phase of each program-related improvement, a qualified vertebrate paleontologist will review the geotechnical report data, with particular regard to location and depth of earthmoving and the rock unit(s) being encountered. The review is for the purpose of assessing potential for fossil remains being encountered by earth moving. If previously undisturbed strata with potential for containing fossil remains will be encountered by earthmoving, measures 4.4-11 through 4.4-18 will be implemented.

4.4-11 **Museum Storage Agreement.** The Western Science Center (WSC) will be the designated museum repository for any vertebrate, invertebrate, and plant fossil remains and associated specimen data and corresponding geologic and geographic site data that might be recovered from the site as a result of the Paleontological Resource Impact Mitigation Plan (PRIMP). Prior to any earthmoving on-site, the paleontologist will develop a formal agreement with the museum regarding final disposition and permanent storage and maintenance of the fossil collection and associated data. The agreement will cover, but not necessarily be limited to, museum requirements regarding: 1) level of treatment of the collection; 2) storage and maintenance fees, if any; 3) purchase of specimen storage cabinets and drawers, as well as specimen trays, vials, specimen data cards, and other curatorial supplies, if required.

4.4-12 **Discovery Clause/Treatment Plan:** As part of the PRIMP, the paleontologist will develop a discovery clause/treatment plan (DC/TP) to allow for additional tasks—recovery; geologic mapping; fossiliferous rock sample processing; specimen preparation, identification, curation, cataloguing, data entry; specimen storage and maintenance by museum—and manpower required to treat a large or productive fossil occurrence that cannot be treated without diverting the monitor from routine monitoring. The DC/TP will also include approved procedures and lines of communication to be followed by specific individuals if fossil remains are uncovered by earthmoving, particularly when a palaeontologic monitor is not present on-site. Names and telephone numbers of contact personnel will be included in the lines of communication. The preparation of this PRIMP ensures compliance with Mitigation Measure 4.4-12.

4.4-13 **Preconstruction Meeting:** The paleontologist or field supervisor, as well as a palaeontologic construction monitor, will attend a preconstruction meeting to explain the PRIMP to construction contractor and Richland Communities staff. The presentation will summarize mitigation procedures to be employed by PRIMP personnel and will detail procedures and lines of communication, as specified in the City of Menifee Conditions of Approval, to be followed by specific project personnel when fossil remains are found on-site.

The paleontologist or field supervisor will inform the construction contractor of the following items:

1) Routine mitigation measures (primarily monitoring and test screening) to be employed by a monitor during earthmoving.

2) The potential for fossil remains being uncovered by earthmoving in particular areas of the site and the need to implement specific actions and additional mitigation measures when a fossil occurrence is uncovered by earthmoving.

3) Functions and responsibilities of the monitor when fossil remains are uncovered by earthmoving and can be recovered without diverting the monitor from monitoring—temporarily divert earth moving around fossil site until remains are evaluated and recovered, and earthmoving is allowed to proceed through the site by monitor; if approved by the construction contractor, enlist the assistance of earth-moving equipment and operator to expedite recovery of remains, obviate need for additional personnel, and reduce any potential construction delay.

4) Functions and responsibilities of the monitor when a fossil occurrence is uncovered by earthmoving and is sufficiently large or productive that it cannot be recovered without diverting the monitor from monitoring.

   a. Flag the site.

   b. Advise construction contractor to avoid fossil site until further notice (usually less than 2 days).

   c. Call the project paleontologist or field supervisor to site.

5) Functions and responsibilities of the paleontologist or field supervisor when notified by the monitor that a large or productive fossil occurrence has been uncovered by earthmoving and cannot be recovered without diverting the monitor from monitoring. Evaluate occurrence to determine if recovery is warranted.

   a. If recovery is warranted, notify construction contractor and Richland Communities of the necessity for implementing additional mitigation measures specified in DC/TP; initiate increased level of monitoring, if not already in effect, in immediate vicinity of fossil site and assigning additional personnel to PRIMP.

b. Within 24 hours after approval, mobilize recovery crew to recover occurrence; supervise recovery of occurrence and its transport to laboratory facility or to a location elsewhere at site approved by the construction contractor for initial/field processing of a fossiliferous rock sample or to laboratory facility for preparation of a fossil specimen.

c. If warranted and approved by construction contractor, enlist the assistance of the earth-moving equipment and operator to expedite recovery of occurrence.

d. To obviate need for additional personnel and reduce any potential construction delay, after recovery of occurrence, have construction contractor allow earth moving to proceed through fossil site.

e. Notify Richland Communities of recovery (or of decision not to recover fossil occurrence, if appropriate) and of authorization for earth moving to proceed through fossil site.

6) Responsibilities of the construction contractor and earth-moving equipment operators if fossil remains are uncovered by earthmoving, particularly if a monitor is not present at the site when the remains are encountered.

a. Avoid disturbance of fossil site by earth moving.

b. Notify monitor, the paleontologist, or the field supervisor and Richland Communities of the fossil occurrence.

c. Avoidance of fossil site by earthmoving activities.

d. Assist with equipment and operator to expedite recovery of occurrence.

These measures will obviate need for additional personnel, reduce any potential construction delay, and allow for earthmoving to proceed through the site following approval by monitor. The construction contractor and Richland Communities staff will be shown examples of fossil specimens similar to those that might be encountered by earthmoving on-site. If warranted, the paleontologist or field supervisor and a monitor will give a similar presentation to the earth-moving equipment operators at one of their earliest safety meetings. The operators will be instructed on recognizing fossil remains in the field, informed of their responsibilities if they observe fossil remains when the monitor is not present at the site (avoid disturbance of occurrence by earthmoving; have construction contractor call monitor to fossil site; expedite recovery of occurrence, if requested), and advised that unauthorized collecting of fossil remains is illegal.

4.4-14 **Monitoring Earthmoving:** Earthmoving will be monitored by a palaeontologic monitor only in those areas of the site where earthmoving will disturb soils greater than five feet deep (monitoring will not be conducted in areas in which soils will be buried but not disturbed).

Monitoring will not be implemented until earthmoving has reached a depth of five feet below current grade. Monitoring will consist of visually inspecting freshly exposed rock and debris for larger fossil remains and periodically dry test screening a small (25 pound) sample of rock and debris with a 20-mesh box screen for smaller vertebrate fossil remains. Monitoring will be conducted on a full-time basis. However, if too few or no fossil remains are uncovered by earthmoving in areas underlain by a particular rock unit, based on the professional recommendation of L&L, monitoring can be reduced to half or quarter time, generally, or suspended once 50 percent of earthmoving in the area underlain by the rock unit has been completed. Alternatively, if significant fossil remains are uncovered by earthmoving, based on the professional recommendation of L&L, monitoring may be increased in areas underlain by the fossil-bearing rock unit, at least in the immediate vicinity of the fossil site.

4.4-15 **Large-Specimen Evaluation and Recovery Options**

1) If a large fossil specimen (unable to be picked up easily by hand) is found as a result of monitoring earthmoving and the specimen can be recovered without significantly diverting the monitor from monitoring, earthmoving will be temporarily diverted around the fossil site and the specimen will be evaluated and, if warranted, excavated; covered with a protective plaster-impregnated burlap jacket, if required; and recovered.

2) If necessary and approved by the construction contractor, earth-moving equipment and an operator will be enlisted to expedite recovery of the specimen and obviate the need for additional personnel, and the construction contractor will be allowed to have earthmoving proceed through the fossil site immediately after recovery of the specimen. A temporary field number will be assigned to the specimen; the field number, a preliminary field identification, and pertinent specimen (field number, identification by taxon and element) and geologic (particularly stratigraphic level within rock unit) and geographic site data (location, elevation) will be recorded in the monitor's daily monitoring log; and the field number recorded and the fossil site location plotted on a map of the site.

3) At the end of the day the monitor or (following their next site inspection) the field supervisor will transport the fossil remains and associated data to a laboratory facility for further treatment (see Mitigation Measure 4.4-17). If appropriate, samples of fossil wood will be submitted for carbon-14 dating analysis.

4) If a fossil specimen is found and is sufficiently large that it cannot be recovered without significantly diverting the monitor from monitoring, the fossil site will be flagged with colored survey ribbon to temporarily divert earthmoving around the site, the construction contractor will be advised to avoid the site until further notice (usually less than 2 days), and the paleontologist or field supervisor will be called to the site. The grading contractor will notify Richland Communities and L&L of the occurrence and of the avoidance of the site. The paleontologist or field supervisor will evaluate the specimen for significance and continuity to determine if recovery is warranted.

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a. If specimen recovery is not warranted, no further action will be taken to preserve the fossil site or remains, the construction contractor will be allowed to have earthmoving proceed through the site immediately, and Richland Communities will be notified of the decision not to recover the specimen and of authorization for earthmoving to proceed through the fossil site.

b. If specimen recovery is warranted, the paleontologist or field supervisor will notify the construction contractor, Richland Communities, and the City of Menifee Community Development Director of the necessity for implementing additional mitigation measures specified in the DC/TP; initiating full-time monitoring, if not already in effect, at least in the immediate vicinity of the site in areas underlain by the fossil-bearing rock unit; and assigning additional personnel to the PRIMP. Within 24 hours after Richland Communities' approval, as secured by L&L, a recovery crew will be mobilized to recover the specimen. The size of the crew will reflect the size of the specimen and the need to recover the specimen as quickly as possible.

   The specimen will be excavated with hand tools, covered with a protective plaster-impregnated burlap jacket, and recovered. If necessary and approved by the construction contractor, earth-moving equipment and an operator will be enlisted to expedite recovery of the specimen, reduce any potential construction delay, and obviate the need for additional personnel. The construction contractor will be allowed to have earthmoving proceed through the fossil site immediately after recovery of the specimen. Richland Communities will be notified of the recovery and of authorization for earthmoving to proceed through the fossil site. A temporary field number will be assigned to the specimen; the field number, a preliminary field identification, and pertinent specimen (field number, identification by taxon and element) and geologic (particularly stratigraphic level within rock unit) and geographic site data (location, elevation) will be recorded in the monitor's daily monitoring log; and the field number will be recorded and the fossil site location plotted on a map of the site. The field supervisor and, if necessary, a crew member will transport the fossil specimen and associated site data to a laboratory facility for further treatment (see Mitigation Measure 4.4-17).

4.4-16 **Small-Specimen Sample Evaluation, Recovery, and Processing.** If a sufficient number of smaller vertebrate fossil remains are found at one site as a result of test screening by the monitor, the fossil site will be flagged with colored survey ribbon to temporarily divert earthmoving around the site. The construction contractor will be advised to avoid that site until further notice (usually less than two days) and, if requested by the monitor, in order to expedite recovery of a fossiliferous rock sample, reduce any potential construction delay, and obviate the need for additional personnel, the construction contractor will have earth-moving equipment and an operator acquire a rock sample from the fossil site and transport the sample, if possible, to a nearby temporary location at the site approved by the construction contractor.

The construction contractor will notify Richland Communities and L&L of the occurrence and of the avoidance of the fossil/storage site. If a sample is recovered, the construction contractor can continue earthmoving through the fossil site immediately after recovery of the sample. The monitor will notify Richland Communities of the recovery of the sample and of authorization for earthmoving to proceed through the fossil site. The paleontologist or field supervisor will be called to the fossil/storage site to determine if the fossil site/sample is sufficiently productive to warrant recovery of a large sample of fossiliferous rock to process for additional small remains. (Previous experience has demonstrated that only some fossil sites require sampling/sample processing, but more than 95 percent of the specimens recovered as a result of some mitigation programs were recovered as a result of sample processing.)

1) If the site/sample is determined too unproductive or the remains too poorly preserved or insufficiently diagnostic, no further action will be taken to preserve the fossil site/sample or remains, the construction contractor will be allowed to continue earthmoving through the fossil/storage site immediately, and Richland Communities will be notified of the decision not to recover/process a sample and of authorization for earthmoving to proceed through the fossil/storage site.

2) If sample recovery is warranted, the paleontologist or field supervisor will notify the construction contractor and the City of Menifee Community Development Director of the necessity for implementing additional mitigation measures specified in the DC/TP and assigning additional personnel to the PRIMP.

    a. Within 24 hours after approval, a recovery crew will be mobilized to recover the sample. The size of the crew will reflect the need to recover the sample as quickly as possible. The field supervisor will record the size and supervise recovery of the sample. Up to three tons of fossiliferous rock will be recovered. The sample will be excavated with hand tools for recovery. If necessary and if approved by the construction contractor, earth-moving equipment and an operator will be enlisted to expedite transportation of the sample to the processing facility site, obviate the need for additional personnel, and reduce any potential construction delay. The construction contractor will be allowed to have earthmoving proceed through the fossil site immediately after recovery of the sample. The paleontologist or field supervisor will notify Richland Communities of recovery of the sample and of authorization for earthmoving to proceed through the fossil site.

    b. A temporary field number will be assigned to the sample; the field number and pertinent specimen (field number, identification by taxon and element) and geologic (particularly stratigraphic level within rock unit) and geographic site data (location, elevation) will be recorded in the monitor's daily monitoring log; and the field number will be recorded and the fossil site location plotted on a map of the site. The field supervisor and, if necessary, a crew member will transport the sample to another location at the site approved by the construction contractor or to an off-site location

for initial/field processing (wet screening) of the sample. The total weight of all samples from each fossil-bearing rock unit at the site will not exceed three tons.

c. If warranted, the field supervisor will set up a field processing facility for wet screening the sample at a site location approved by the construction contractor. Wet screening will consist of sieving rock through a 20-mesh box screen (and/or finer) immersed in a tub of water to remove the smaller particles (clay and silt) from the larger particles (sand and rock) and small fossil remains. This could result in a reduction in sample weight/volume in excess of 90 percent. If necessary, rock will be soaked in an environmentally safe dispersant (citrus oil) prior to screening to improve separation of the clay particles from the rest of the sample during screening. The monitor will conduct wet screening if it can be accomplished without diverting the monitor from monitoring. If it is not possible to have the monitor perform the wet screening, a field technician will be assigned to the task. Following his next site inspection, the field supervisor will transport the concentrate (larger particles and small fossil remains) generated by initial processing to a laboratory facility for final/laboratory processing.

d. If fossil remains in the concentrate are sufficiently fossilized (dense), an environmentally safe heavy liquid (sodium polytungstate), if appropriate, will be used by the senior vertebrate paleontologist to separate the remains from the remaining sand and rock particles. When added to a beaker filled with heavy liquid, the concentrate will separate, the particles floating to the surface, and the remains sinking to the bottom, from where they are retrieved. This technique can result in a further sample weight/volume reduction in excess of 90 percent (less than 1 percent of original sample size). The final concentrate will be examined under a microscope and fossil specimens recovered from any remaining sand and rock particles. If the fossil bone in the original concentrate is not sufficiently dense for use of the heavy-liquid separation technique, the entire sample of concentrate will be sorted under a microscope for fossil remains. Recovered fossil remains will then be treated (see Mitigation Measure 4.4-17).

e. During final processing of a sample, the senior vertebrate paleontologist will continually evaluate the results of field and laboratory processing. If the sample is insufficiently productive or the fossil remains are too poorly preserved, the senior vertebrate paleontologist will have the option of discontinuing further laboratory processing of the sample, having field processing of the remainder of the sample suspended, and disposing of the remainder of the sample and unprocessed concentrate. Similarly, processing will be discontinued if, after preliminary identification of some specimens, the remains are determined insufficiently diagnostic or diverse taxonomically, or the species represented are the same as those in another sample from the fossil-bearing rock unit. (Previous experience has demonstrated that only some fossil sites require sample processing, and only some of these sites require

processing of an entire three-ton sample.) If appropriate, small splits from one or more samples will be submitted for palynological analysis.

4.4-17 **Fossil Treatment.** Final treatment of all fossil specimens recovered from the site as a result of the PRIMP will be conducted at a laboratory facility. Larger vertebrate fossil specimens will be removed from their protective jackets, prepared to the point of identification using hand tools, and hardened or stabilized with a penetrating solution by a preparator. All recovered fossil specimens will be identified to the lowest taxonomic level possible by knowledgeable vertebrate and invertebrate paleontologists and, if required, other knowledgeable paleontologists (e.g., paleobotanists, micropaleontologists, palynologists). The specimens will then be curated (assigned and labeled with museum specimen data and corresponding site numbers, placed in specimen trays and, if appropriate, vials with completed specimen data cards); catalogued (specimen and site numbers and specimen data and corresponding geologic and geographic site data, respectively, archived [entered into appropriate catalogs and computerized databases]); and accessioned into the museum fossil collection, where they will be permanently stored, maintained, and, along with associated data, made available for future study by qualified investigators. With the possible exception of tasks that might be conducted by museum staff (curation, cataloging), all treatment of fossil specimens will be conducted by a laboratory technician. Fossil specimen preparation, identification, curation, and cataloguing are now required before a fossil collection will be accepted by most museum repositories, including the WSC. Moreover, the scientific importance of a fossil specimen cannot be evaluated until the specimen has been identified to the lowest taxonomic level possible, and specimen identification often is not possible without prior preparation.

4.4-18 **Final Report.** A final technical report of findings will be prepared by the paleontologist and will describe the site's stratigraphy; summarize field and laboratory methods employed during the PRIMP; include a taxonomic list and an inventory of catalogued fossil specimens recovered as a result of the PRIMP; evaluate the scientific importance of the specimens; and discuss the relationship of the fossil assemblage from any newly recorded fossil site at the Project Site to relevant fossil assemblages from fossil sites in other areas. The report will be submitted to the contractor, Richland Communities, and the City of Menifee Community Development Director. Submission of the final report will signify completion of the PRIMP and will ensure Richland Communities' compliance with Public Resources Code Section 21081.6 (mitigation monitoring, reporting, and compliance).

4.1.5 Hydrology, Flooding, and Drainage

Approved Project Impact Analysis

The Certified EIR determined that two drainage areas would be constructed for the Approved Project—drainage area 'A', which would contain approximately 565 acres, on-site and off-site, and produce a 100-year storm runoff of 1,000.6 cubic feet per second (cfs) before retention. Two flow-by retention basins would be developed to keep the flow at or below the existing level. The two flow-by basins were designed to outlet to reduce the peak flows for the 2-year, 5-year, and 10-year storm events and for all storm velocity durations.

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These basins would also serve as water quality basins. Basin A-1 provided a volume of 4.04 acre-feet, and Basin A-2 provided a volume of 2.44 acre-feet. The smaller drainage area 'B' would contain 17.01 acres and produce a 100-year storm runoff of 38.6 cfs. This flow would drain to an existing canyon on the east side of the TTM 31194 site. The flow rate produced from the developed condition was less than the existing level by 2.8 cfs. However, 10-year, 24-hour-unit hydrographs calculated for the area determined that a retention basin of 0.38 acre-feet was required to retain the excess runoff generated from Area B during a 10-year storm. A 0.82-acre-foot basin was proposed to provide retention and water quality treatment.

Storm drains would be installed on-site, and detention basins were proposed to capture runoff and slow the rate of flow. The Approved Project required drainage and flood control facilities and improvements to be provided in accordance with Riverside County Flood Control and Water Conservation District requirements. Proposed grading and drainage improvements conformed to Section 2907 and 7012 of the Uniform Building Code and complied with the basin plan of the Regional Water Quality Control Board, Santa Ana Region. The Certified EIR found that the Approved Project would result in less-than-significant impacts with no mitigation.

Approved Project Mitigation Measures

No mitigation measures were required for the Approved Project regarding hydrology, flooding, and drainage.

Proposed Project Impact Analysis

The Proposed Project would increase the residential density and therefore change the hydraulic modeling of the Project Site, resulting in modification of drainage management areas (DMA) 'A', 'C', and 'D'. The Proposed Project would further subdivide the overall hydrological drainage areas into smaller drainage management areas, designated 'A' through 'L'. As described in the hydrology report prepared for the Proposed Project (see Appendix C), the Proposed Project would revise the drainage pattern of the proposed DMA 'A', 'C', and 'D'. The revised DMA 'A' comprises 95.88 acres and is tributary to water quality and detention basin 'A' in the northwesternmost corner of the TTM 31194 site. The revised DMA 'C' comprises 14.19 acres and is tributary to water quality and detention basin 'C' in the southeasternmost corner of the TTM 31194 site. The revised DMA 'D' comprises 54.51 acres and is tributary to water quality and detention basin 'D' in the center of the TTM 31194 site.

The proposed on-site water quality and detention basins are being designed to meet water quality requirements and mitigate for any increase in runoff associated with the development of areas 'A', 'C', and 'D'. Furthermore, basins A and C are being designed as "Extended Detention Basins," and each would include a concrete-lined forebay, low-flow gravel diversion channels, and a sand filter with a metered outlet structure. Basin D is designed as an infiltration basin and is sized to capture and infiltrate the water quality volume in its entirety. Development of the Proposed Project does not propose a significant change over the Approved Project; however, peak flow rates would be expected to increase with the addition of impervious area. This increase in flow rate and any increase in runoff volume would be mitigated by the proposed detention and water quality basins throughout the site. Based on the results of the hydrology report (Appendix E), the proposed drainage facilities would adequately protect the site areas from flood damage associated with the 100-year storm event. The proposed facilities, with ultimate development and adequate maintenance, would convey flows safely through the site area in accordance with City of Menifee requirements. Because the proposed drainage facilities will adequately

protect the site from flood damage and accommodate for the increased flow rate of water due to additional residential lots, the Proposed Project will result in less-than-significant impacts with no mitigation.

Proposed Project Mitigation Measures

No mitigation measures are required for the Proposed Project regarding hydrology, flooding, and drainage.

4.1.6 Water Quality

Approved Project Impact Analysis

Construction Impacts

The Certified EIR determined that the Approved Project would include grading operations that would result in potential short-term erosion and sedimentation impacts. Pursuant to requirements of the State Water Resources Control Board, the project applicant was required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for construction activities. Additionally, since the Approved Project is in the San Jacinto Watershed, it was subject to a special NPDES permit (No. CAG 618005) per Order No. 01-34. Therefore, the Approved Project was required to comply with the requirements of the NPDES construction permit by developing and implementing a Storm Water Pollution Plan (SWPPP), approved by the Executive Officer of the Regional Water Quality Control Board (RWQCB), that specified best management practices (BMP) to minimize pollutants in stormwater runoff. Implementation of Mitigation Measures 4.6-1 through 4.6-6 were required to ensure that potential impacts were reduced to less-than-significant levels.

Operational Impacts

Implementation of the Approved Project would also permanently alter the composition of the surface runoff by grading the site surfaces; by construction of impervious surfaces such as streets, roofs and parking facilities; and by irrigation of landscaped areas. In compliance with the Santa Ana RWQCB Order No. R8-2002-0011/NPDES Permit No. CAS 618033, a project-specific water quality management plan (WQMP) had been prepared for Approved Project. As specified by the WQMP, treatment control BMPs were proposed to remove pollutants typically associated with urban runoff. The Approved Project proposed several detention basins, one of which would be used for retention of stormwater, and the others of which would be used to treat the project's stormwater in addition to retention. The basins were proposed at the points where runoff from developed portions of the TTM 31194 site would enter the on-site natural drainage.

The Approved Project generated a demand for treatment of sewage, which required treatment and ultimate disposal by Eastern Municipal Water District (EMWD). EMWD would manage the TTM 31194 site's wastewater in accordance with the State Water Resources Control Board and Santa Ana RWQCB. The Approved Project complied with the basin plan adopted by the RWQCB.

Approved Project Mitigation Measures

4.6-1 The developer or builder for TTM No. 31194 shall be required, pursuant to requirements of the State Water Resources Control Board, to obtain a NPDES construction permit, prior to

issuance of grading permits. The NPDES permit will apply to all construction activities associated with the Approve Project.

Construction activities include clearing, grading, or excavation that results in the disturbance of at least five acres of total land area or activity which is part of a larger common plan of development of one acre or greater. The permit requires the applicant to develop and implement a SWPPP, that specifies BMPs to minimize pollutants in storm water runoff, as well as non-storm water discharges. Examples of BMPs include, but are not limited to energy dissipation structures and rip-rap at stormwater discharge points to stabilize flow and reduce velocities; mulching cleared or freshly seeded areas for erosion/sedimentation control; and using geotextiles and mats for erosion control during construction, storm drain inlet/outlet protection for siltation control, and slope drains for erosion control. The permit also requires a monitoring, reporting and inspection program to be developed and implemented to assure the effectiveness of the controls.

4.6-2 Prior to approval of a Final Map and final engineering drawings, the County shall verify that the Final Map and engineering drawings indicate the size and location of the structural source control BMPs specified by the project's Water Quality Management Plan.

4.6-3 Prior to issuance of occupancy permits, the County shall verify that the project's CC&Rs specify the homeowners' association ownership maintenance requirements for private storm drains and catch basins as specified in the project's Water Quality Management Plan.

4.6-4 Prior to issuance of occupancy permits, the County shall verify that the project's CC&Rs contain the activity restrictions and the property owner environmental education awareness materials for water quality specified by the project's Water Quality Management Plan.

Proposed Project Impact Analysis

Construction Impacts

As with the Approved Project, the Proposed Project would be required to obtain a NPDES permit for construction activities and a special NPDES permit (No. CAG 618005) per Order No. 01-34. The Proposed Project would be required to comply with the requirements of the NPDES construction permit by developing and implementing a SWPPP, approved by the Executive Officer of the RWQCB, that specifies BMPs to minimize pollutants in stormwater runoff. Implementation of Mitigation Measures 4.6-1 through 4.6-6 would still be required to ensure that potential impacts are reduced to less-than-significant levels.

Operational Impacts

As with the Approved Project, implementation of the Proposed Project would permanently alter the composition of the surface runoff by grading site surfaces; constructing impervious surfaces such as streets, roofs, and parking facilities; and irrigating landscaped areas. An updated WQMP has been prepared for the Proposed Project (Hunsaker & Associates 2021)(see Appendix F).

The Proposed Project would generate sewage, which would require treatment and ultimate disposal by EMWD. EMWD would manage the Project Site's wastewater in accordance with the State Water Resources Control Board and Santa Ana RWQCB. Similar to the Approved Project, the Proposed Project would comply with the basin plan adopted by the RWQCB. Therefore, the Proposed Project will result in less-than-significant impacts with mitigation measures, as described below.

Proposed Project Mitigation Measures

The mitigation measures below have been revised to show the change in jurisdiction and will result in less-than significant impacts of the Proposed Project on water quality

4.6-1 The developer or builder for TTM No. 31194 shall be required, pursuant to requirements of the State Water Resources Control Board, to obtain a NPDES construction permit prior to issuance of grading permits. The NPDES permit will apply to all construction activities associated with the proposed project.

Construction activities include clearing, grading, or excavation that results in the disturbance of at least five acres of total land area or activity that is part of a larger common plan of development of one acre or greater. The permit requires the applicant to develop and implement a SWPPP that specifies BMPs to minimize pollutants in stormwater runoff and nonstorm water discharges. Examples of BMPs include but are not limited to installing energy dissipation structures and rip-rap at stormwater discharge points to stabilize flow and reduce velocities; mulching cleared or freshly seeded areas for erosion/sedimentation control; and using geotextiles and mats for erosion control during construction, storm drain inlet/outlet protection for siltation control; and slope drains for erosion control. The permit also requires a monitoring, reporting, and inspection program to be developed and implemented to ensure the effectiveness of the controls.

4.6-2 Prior to approval of a Final Map and final engineering drawings, the ~~County~~ City shall verify that the Final Map and engineering drawings indicate the size and location of the structural source control BMPs specified by the project's Water Quality Management Plan.

4.6-3 Prior to issuance of occupancy permits, the ~~County~~ City shall verify that the project's CC&Rs specify the homeowners association's ownership maintenance requirements for private storm drains and catch basins, as specified in the project's Water Quality Management Plan.

4.6-4 Prior to issuance of occupancy permits, the ~~County~~ City shall verify that the project's CC&Rs contain the activity restrictions and the property owner environmental education awareness materials for water quality specified by the Project's Water Quality Management Plan.

4. CEQA Analysis

4.1.7 Geology and Slope Stability

Approved Project Impact Analysis

The Certified EIR determined that the TTM 31194 site is suitable for development from a geotechnical viewpoint. Based on the topography of the site, implementation of the Approved Project would create cut slopes and fill slopes with maximum heights of approximately 110 feet and 20 feet, respectively. Any existing fill encountered during site development would be removed from beneath all improvements and in areas receiving new fill. The existing fill and alluvium would be stockpiled and reused as engineered fill if it was free of vegetation and other deleterious materials. The exposed soils would be scarified to a minimum depth of eight inches, moisture-conditioned to near optimum moisture content, and recompacted to a minimum of 90 percent of the soil's maximum density. The previously removed soils, or approved import, would then be placed as properly compacted fill. All excavated materials except oversized rocks (over 8 inches in greater dimension), would be suitable for placement as compacted fill.

"Marginal ripping" to "very difficult ripping with some blasting" could be required at shallow depths in parts of the TTM 31194 site. The presence of alluvium and potential for presence of undocumented fill was a potentially significant impact that required mitigation in the form of remedial grading.

The Certified EIR determined that no active or potentially active faults were on the property; however, secondary hazards associated with seismic activity had the potential to affect the site, as described below.

- **Ground Shaking and Rupture.** No active or potentially active faults are on the TTM 31194 site; thus, the potential for ground rupture is low and was not considered significant. The seismic risk for the Approved Project area was not considered substantially different than that of other similar properties in Southern California, and the geologic investigations conducted for the site concluded that, from a geologic standpoint, the property was suitable for development as proposed. Construction of the proposed structures in accordance with the Uniform Building Code ensured that potential ground shaking impacts would not result in a significant impact.

- **Liquefaction and Seismically Induced Settlement.** Due to the shallow granitic bedrock at the TTM 31194 site, impacts associated with liquefaction and seismically induced settlement were considered unlikely.

- **Tsunami and Seiche.** The Pacific Ocean is over 25 miles west of the TTM 31194 site; there is no potential for tsunamis. Lake Skinner is approximately 21 roadway miles southeast, and Canyon Lake is approximately 11 miles northwest of the TTM 31194 site. The TTM 31194 site is outside of the dam inundation area for these lakes, as was depicted in the County's General Plan. The potential for seiches on the TTM 31194 site was deemed nonexistent.

Approved Project Mitigation Measures

4.7-1 Prior to the issuance of grading permits and in compliance with the requirements of County Ordinances, a detailed geotechnical report(s) shall be submitted to the County's Engineering Division for review and approval. The report(s) shall identify and address site-specific (a)

underlying soil conditions, (b) liquefaction potential, (c) seismic parameters and building requirements and (d) slope stability. The measures recommended by the final geotechnical report(s) shall be identified on applicable grading plans and shall be implemented to the satisfaction of the County Geologist.

4.7-2 All earthwork and grading shall be performed in accordance with all applicable requirements of the Grading and Excavation Code and the Grading Manual of the County of Riverside, in addition to the provisions of the 1997 Uniform Building Code (UBC), including Appendix Chapter 33. Grading shall also be performed in accordance with applicable provisions of the Standard Grading Specifications contained in the geotechnical reports prepared by Leighton and Associates (see EIR Appendices H1 and H2).

4.7-3 The project geotechnical engineer or qualified representative shall be notified at appropriate times to provide observation and testing services during clearing operations and to verify compliance with the recommendations made by the project geotechnical reports. In addition, any buried structures or unusual or adverse soil conditions encountered that are not described or anticipated in the geotechnical reports prepared by Leighton and Associates shall be brought to the immediate attention of the geotechnical consultant.

4.7-4 All existing low-density and potentially collapsible soil materials, such as loose manmade fill and alluvium, shall be removed to underlying competent bedrock from each area to receive compacted fill. Prior to placing structural fills, the exposed bottom surfaces in each removal area shall first be scarified to a depth of 6 inches or more, watered or air-dried as necessary to achieve near-optimum moisture conditions, and then recompacted in-place to a minimum relative compaction of 90 percent. Actual depths and horizontal limits of any removals shall be determined during grading on the basis of in-grading observations and testing performed by the project geotechnical consultant and/or engineering geologist.

4.7-5 In the event import soils are needed to achieve final design grades, all potential import materials shall be free of deleterious/oversize materials, non-expansive, and approved by the project geotechnical consultant prior to commencement of delivery onsite.

4.7-6 An observation of clearing operations, removal of unsuitable surficial materials, and general grading procedures shall be performed by the project geotechnical consultant or his representative. Fill shall not be placed without prior approval from the geotechnical consultant. The project geotechnical consultant or his representative shall also be present onsite during all grading operations to verify proper placement and adequate compaction of all fill materials, as well as to verify compliance with the other recommendations presented in the project geotechnical reports.

4.7-7 No oversized rocks (greater than 12 inches) shall be placed within 10 feet of the finished grade.

4. CEQA Analysis

4.7-8 Cut and fill slopes steeper than 3:1 (horizontal: vertical) and exceeding a vertical height of 30 feet shall be constructed with drainage terraces in accordance with Chapter 33 of the 1997 UBC.

Proposed Project Impact Analysis

Due to anticipated shallow rock conditions and proposed site grading, deep excavations on this site are expected to require heavy ripping, blasting, or other rock-reduction techniques and would likely generate oversized rock materials (rock fragments greater than 12 inches). By County standards, oversized rock should not be placed in the upper 10 feet of finished pad grades. Implementation of Mitigation Measures 4.7-1 through 4.7-8 would still be required to ensure that potential impacts are reduced to less-than-significant levels.

The Proposed Project is in the same footprint as the Approved Project; therefore, no active or potentially active faults are on the property. Secondary hazards associated with seismic activity would be similar to the Approved Project, including ground shaking and rupture, liquefaction and seismically induced settlement, and tsunami and seiche. Therefore, the Proposed Project would result in less-than-significant impacts with mitigation measures, as described below.

Proposed Project Mitigation Measures

The mitigation measures below have been revised or updated to show the changes in jurisdiction and state local regulations.

4.7-1 Prior to the issuance of grading permits and in compliance with the requirements of ~~County~~ City ordinances, a detailed geotechnical report(s) shall be submitted to the ~~County's~~ City's Engineering Division for review and approval. The report(s) shall identify and address site-specific (a) underlying soil conditions, (b) liquefaction potential, (c) seismic parameters and building requirements, and (d) slope stability. The measures recommended by the final geotechnical report(s) shall be identified on applicable grading plans and shall be implemented to the satisfaction of the ~~County~~ City Geologist.

4.7-2 All earthwork and grading shall be performed in accordance with all applicable requirements of ~~the Grading and Excavation Code and the Grading Manual of the County of Riverside~~ Chapter 8.26, Grading Regulations, of the Menifee Municipal Code, in addition to the provisions of the ~~1997 Uniform Building Code (UBC)~~2021 International Building Code. Grading shall also be performed in accordance with applicable provisions of the Standard Grading Specifications in the geotechnical reports prepared by Leighton and Associates (see ~~EIR Appendices H1 and H2~~ Appendix G).

4.7-3 The Project's geotechnical engineer or qualified representative shall be notified at appropriate times to provide observation and testing services during clearing operations and to verify compliance with the recommendations made by the Project's geotechnical reports. In addition, any buried structures or unusual or adverse soil conditions encountered that are not described or anticipated in the geotechnical reports prepared by Leighton and Associates shall be brought to the immediate attention of the geotechnical consultant.

4.7-4 All existing low-density and potentially collapsible soil materials, such as loose man-made fill and alluvium, shall be removed to underlying competent bedrock from each area receiving compacted fill. Prior to placing structural fills, the exposed bottom surfaces in each removal area shall first be scarified to a depth of six inches or more, watered or air dried as necessary to achieve near-optimal moisture conditions, then recompacted in place to a minimum relative compaction of 90 percent. Actual depths and horizontal limits of any removals shall be determined during grading on the basis of in-grading observations and testing performed by the Project's geotechnical consultant and/or engineering geologist.

4.7-5 In the event import soils are needed to achieve final design grades, all potential import materials shall be nonexpansive, free of deleterious/oversized materials, and approved by the project geotechnical consultant prior to commencement of delivery on-site.

4.7-6 An observation of clearing operations, removal of unsuitable surficial materials, and general grading procedures shall be performed by the Project's geotechnical consultant or his/her representative. Fill shall not be placed without prior approval from the geotechnical consultant. The project geotechnical consultant or his/her representative shall also be present on-site during all grading operations to verify proper placement and adequate compaction of all fill materials as well as to verify compliance with the other recommendations in the Project's geotechnical reports.

4.7-7 No oversized rocks (greater than 12 inches) shall be placed within 10 feet of the finished grade.

4.7-8 Cut-and-fill slopes steeper than 3:1 (horizontal: vertical) and exceeding a vertical height of 30 feet shall be constructed with drainage terraces ~~in accordance with Chapter 33 of the 1997 UBC~~.

4.1.8 Soils, Slopes, and Erosion Potential

Approved Project Impact Analysis

Soil Settlement and Expansion Potential

The Certified EIR determined that the majority of the on-site materials consisted of low plastic clays to fine sandy silts and generally possessed a very low to low expansion potential. Though they were not observed during field reconnaissance, it was possible that undocumented fills or other materials with an expansion potential greater than low could be encountered during construction. If present, these materials would not be suitable for structural development, and this was regarded as a potentially significant impact.

Landform Alteration

The majority of the grading and development was proposed on the southwestern portion of the site and generally avoided the steeper landforms in the northeastern part of the site, which were designated natural open space. The estimated earthwork quantities were 700,000 cubic yards (cy) of cut and 700,000 cy of fill. Grading was proposed over an approximately 165.7-acre disturbance area. Despite some alteration to the

4. CEQA Analysis

natural landform, the majority of the site's steep natural landform was in the open space parts of the site and would be permanently preserved. Project grading would conform to the County's Grading Standards. These standards included, but were not limited to maintaining natural drainage patterns, limiting street grades to less than 15 percent, ensuring slope stability, etc.

Erosion

The Approved Project proposed grading or disturbance of approximately 165.7 acres. Grading would remove the existing vegetative cover and expose the underlying soils, which increased the rate of runoff and increased erosion susceptibility. Soils with slow to medium runoff and slight to moderate erosion potentials covered approximately 45.8 percent of the TTM 31194 site; soils with medium and moderate runoff and erosion potentials covered approximately 31.2 percent of the site; and soils with rapid to high and very high runoff and erosion potential covered approximately 23 percent of the site.

Soils with high erosion susceptibility and fill materials for development areas were subject to potentially significant Project-related erosion because of the removal of stabilizing vegetation and the exposure of erodible materials to wind and water. Potential erosion impacts were greatest in steeper areas and during the first rainy season after grading (before landscaping becomes established). Erosion and dust control techniques would be implemented during construction as part of the required SWPPP and BMPs. With adherence to the SWPPP, the potential for erosion and transport of material within the proposed project boundaries and off-site was reduced to below a level of significance.

Approved Project Mitigation Measures

4.8-1 Prior to the issuance of a grading permit, an overall Conceptual Grading Plan shall be submitted for Planning Department approval. The Grading Plan shall include: 1) techniques employed to prevent erosion and sedimentation during and after the grading process; 2) approximate time frames for grading; 3) identification of areas which may be graded during high probability rain months (January through March); and 4) preliminary pad and roadway elevations.

4.8-2 Where cut and fill slopes are created higher than three feet, detailed Landscaping and Irrigation Plans shall be submitted to the Planning Department prior to Grading Plan approval. The plans shall be reviewed for type and density of ground cover, shrubs, and trees to ensure that plant material would be effective as erosion control and that all slopes would be landscaped per County Ordinance No. 457.

4.8-3 All grading procedures shall be in compliance with the Riverside County Grading Standards including requirements for erosion control during rainy months. The requirements for compliance with County's Grading Standards shall be noted on all grading plans.

4.8-4 Graded, but undeveloped land shall be maintained weed-free and planted with interim landscaping within 90 days of completion of grading, unless building permits are obtained.

4.8-5 Prior to any grading activities, a soils report and geotechnical study shall be performed to further analyze on-site soil conditions and slope stability and shall include the appropriate measures to control erosion.

4.8-6 Potential brow ditches, terrace drains, or other minor swales, determined necessary by the County of Riverside at future stages of project review, shall be lined with natural erosion control materials or concrete.

4.8-7 The locations of potentially compressible soils shall be identified on all Grading Plans. Where development is proposed in areas of compressible soils, deep foundation systems shall be used, or compressible soils shall be completely over excavated and compacted.

Proposed Project Impact Analysis

Soil Settlement and Expansion Potential

Since the Proposed Project would be constructed within the same footprint as the Approved Project, the majority of the on-site materials still consist of low plastic clays to fine sandy silts and generally possess a very low to low expansion potential.

Landform Alteration

The estimated earthwork quantities are 793,000 cy of cut and 793,000 cy of fill. Grading would occur over an approximately 177.2-acre disturbance area. Similar to the Approved Project, implementation of the Proposed Project would result in alterations to the natural landform; however, the majority of the site's steep natural landform is in the open space areas of the site and would be permanently preserved. Project grading would conform to Chapter 9, Article 4, Site Development Regulations and Performance Standards, of the City's Development Code.

Erosion

Development of the Proposed Project would include grading or disturbance of approximately 177.2 acres of the Project Site. Grading would remove the existing vegetative cover and expose the underlying soils, which would increase the rate of runoff and increase erosion susceptibility. Soils with slow to medium runoff and slight to moderate erosion potentials cover approximately 45.8 percent of the property; soils with medium and moderate runoff and erosion potentials cover approximately 31.2 percent of the property; and soils with rapid to high and very high runoff and erosion potentials cover approximately 23 percent of the property.

Soils with high erosion susceptibility as well as fill materials used for development areas would be subject to potentially significant project-related erosion because of the removal of stabilizing vegetation and exposure of erodible materials to wind and water. Potential erosion impacts would be greatest in steep areas and during the first rainy season after grading (before landscaping becomes established). Erosion- and dust-control techniques would be implemented during construction as part of the required SWPPP and its BMPs. With adherence to the SWPPP, the potential for erosion and transport of material within the Proposed Project boundaries and off-site would be reduced to below a level of significance. Therefore, the Proposed Project would result in less-than-significant impacts with mitigation measures, as described below.

4. CEQA Analysis

Proposed Project Mitigation Measures

The mitigation measures below have been revised or updated to show the changes in jurisdiction and state local regulations and ensure that potential impacts are reduced to less-than-significant levels.

4.8-1 Prior to the issuance of a grading permit, an overall Conceptual Grading Plan shall be submitted for City of Menifee Planning Department approval. The Grading Plan shall include: 1) techniques employed to prevent erosion and sedimentation during and after the grading process; 2) approximate time frames for grading; 3) identification of areas which may be graded during high probability rain months (January through March); and 4) preliminary pad and roadway elevations.

4.8-2 Where cut-and-fill slopes are created higher than three feet, detailed landscaping and irrigation plans shall be submitted to the City of Menifee Planning Department prior to Grading Plan approval. The plans shall be reviewed for type and density of ground cover, shrubs, and trees to ensure that plant material would be effective as erosion control and that all slopes would be landscaped per ~~County Ordinance No. 457~~ Title 9, Article 4, Site Development Regulations and Performance Standards, of the City's Development Code.

4.8-3 All grading procedures shall be in compliance with the ~~Riverside County Grading Standards~~ Title 9, Article 4, Site Development Regulations and Performance Standards, of the City's Development Code, including requirements for erosion control during rainy months. The requirements for compliance with ~~County's Grading~~ the City's Site Development Regulations and Performance Standards shall be noted on all grading plans.

4.8-4 Graded, but undeveloped land shall be maintained free of weeds and planted with interim landscaping within 90 days of completion of grading, unless building permits are obtained.

4.8-5 Prior to any grading activities, a soils report and geotechnical study shall be performed to further analyze on-site soil conditions and slope stability and shall include the appropriate measures to control erosion.

4.8-6 Potential brow ditches, terrace drains, or other minor swales determined necessary by the ~~County of Riverside~~ City of Menifee at future stages of project review, shall be lined with natural erosion control materials or concrete.

4.8-7 The locations of potentially compressible soils shall be identified on all Grading Plans. Where development is proposed in areas of compressible soils, deep foundation systems shall be used, or compressible soils shall be completely over excavated and compacted.

4.1.9 Agriculture

Approved Project Impact Analysis

The Certified EIR determined that large portions of the TTM 31194 site had been used for dryland farming over the past 50 years. Agricultural crops on the site primarily consisted of dryland crops, such as wheat and

barley. With implementation of the Approved Project, farming of the site would be precluded. Approximately 164.7 acres of the 204.7-acre TTM 31194 site was designated Locally Important farmland. Several properties surrounding the TTM 31194 site were zoned for agricultural use. Adjacent to the TTM 31194 site on the north side are several properties that were zoned for Residential Agriculture (R-A-1, R-A-2 1/2, and R-A-5). Along the property's western boundary, properties were zoned for Light Agriculture (A-1-1) and Residential Agriculture (R-A-1). Properties adjacent to the TTM 31194 site on the south side were zoned for Light Agriculture (R-A-1), and Rural Residential (R-R-1). Along the Approved Project's eastern boundary were lands designated for Residential Agriculture (R-A-5) and Industrial Park (I-P). In the County, the development of residential uses adjacent to agriculturally zoned properties is regulated by County Ordinance No. 625 ("Right-to-Farm"). Ordinance No. 625 states that for any agricultural operation that has been in place for at least three years and was not considered a nuisance operation at the time the operation began, no change in surrounding land uses could cause that operation to become a nuisance. Therefore, since the TTM 31194 site was within 300 feet of agriculturally zoned property, a potentially significant impact to agricultural lands required mitigation in the form of compliance with County Ordinance No. 625. Implementation of Mitigation Measure 4.9-1 reduced potential agricultural impacts to less-than-significant.

Approved Project Mitigation Measures

4.9-1 The project shall comply with the County's "Right to Farm" Ordinance (Ordinance No. 625). The ordinance is intended to provide for a means of giving notice to prospective buyers of homes in newly built subdivisions and recently subdivided parcels that they are moving into an agricultural area and that a farm has been in operation legally for at least three years shall not be or become a nuisance simply because residential uses have entered the area and are offended by the odors, dust, etc.

Proposed Project Impact Analysis

The Proposed Project would be within the same footprint as the Approved Project. As described in Section 3.1.1, the Project Site has a land use designation of 2.1–5 du/ac Residential (2.1-5 R) and is zone Planned Development District (PDO-5). General Plan land use designations in the surrounding areas include Rural Residential 5 ac min (RR5) to the north and east, Rural Residential 1 ac min (RR1) to the south, and 2.1–5 du/ac Residential (2.1-5 R) to the west.

According to the City of Menifee's General Plan Land Use Element, areas with land use designation 2.1-5 R would include single-family residential areas in which limited agricultural and animal keeping is permitted; however, intensive animal keeping is discouraged. Therefore, the Proposed Project would be required to comply with Chapter 9.235, Animal Keeping, of the City's Title 9, Planning and Zoning Ordinance.

Additionally, according to the General Plan Environmental Impact Report (EIR), General Plan buildout would place developed urban land uses closer to mapped farmland. Environmental impacts of farming, such as odors, noise, and water and air pollution, would affect future residents of the city near farmland. Such potential conflicts between agricultural and urban land uses would add to pressures on owners of agricultural land to sell and/or convert the land to nonagricultural uses (Menifee 2013a). Ordinance No. 2013-123 states that:

> . . . all resolutions, rules and regulations of the County of Riverside that have been applicable in the implementation of any County Ordinance (including but not limited to the California Environmental Quality Act) to the extent that they applied before incorporation of the City [including Ordinance No. 625], shall remain in full force and effect as resolutions, rules, and regulations of the City of Menifee until suspended or repealed by action of the City. (City of Menifee 2013b)

The Proposed Project would still require implementation of Mitigation Measure 4.9-1 to give notice to prospective buyers of homes in newly built subdivisions and recently subdivided parcels that they are moving into an agricultural area and that a farm that has been in operation legally for at least three years shall not be or become a nuisance simply because residential uses have entered the area and are offended by the odors, dust, etc. Therefore, the Proposed Project would result in less-than-significant impacts with mitigation measures, as described below.

Proposed Project Mitigation Measure

The Approved Project mitigation measure is applicable to the Proposed Project as originally adopted and will reduce potential agricultural impacts to less-than-significant levels.

4.9-1 The project shall comply with the County's "Right to Farm" Ordinance (Ordinance No. 625). The ordinance is intended to provide for a means of giving notice to prospective buyers of homes in newly built subdivisions and recently subdivided parcels that they are moving into an agricultural area and that a farm has been in operation legally for at least three years shall not be or become a nuisance simply because residential uses have entered the area and are offended by the odors, dust, etc.

4.1.10 Mineral Resources

Approved Project Impact Analysis

The Certified EIR determined that the TTM 31194 site is not designated by the State of California as a known mineral resource area, and no mineral resources were identified. Therefore, the Approved Project would not result in the loss of availability of any known mineral resources and would not result in the loss of a designated Aggregate Resource Area identified by the Riverside County General Plan.

The majority of the mines, prospect sites, and mineral resource recovery sites identified near the TTM 31194 site were generally located between 1.5 to 2.5 miles away. Therefore, the Approved Project was not an incompatible land use adjacent to a State-classified or -designated area or existing surface mine. Therefore, impacts to mineral resources were not significant and no mitigation measures were required.

Approved Project Mitigation Measures

No mitigation measures were required for the Approved Project regarding mineral resources.

Proposed Project Impact Analysis

The Proposed Project is within the same footprint as the Approved Project; thus, the Project Site is not designated by the State of California as a known mineral resource area and no mineral resources have been

identified on the Project Site. Therefore, similar to the Approved Project, the Proposed Project would not result in the loss of availability of any known mineral resources and impacts on mineral resources are less-than-significant and no mitigation measures are required

Proposed Project Mitigation Measure

No mitigation measures are required for the Proposed Project regarding mineral resources.

4.1.11 Toxic Substances

Approved Project Impact Analysis

The Certified EIR determined that the predominant land uses proposed for the TTM 31194 site, which included residential development, open space, and neighborhood park, would have little potential for storage of toxic substances other than household chemicals. Common household chemicals are of such a low concentration and volume that they pose no significant impacts to human health and safety. During grading and construction, there was a low potential for the discovery of hazardous materials, and this was regarded as a potentially significant impact. Thus, implementation of Mitigation Measures 4.11-1 through 4.11-5 were required to reduce potential project impacts to less-than-significant levels.

Household waste, such as paints, roofing materials, and solvents, would be used in building and construction of the Approved Project. Disposal of this type of waste is prohibited in County landfills. State, federal, and local laws strictly regulate the storage and use of hazardous materials. Existing control regulations reduced potential impacts associated with storage and use of hazardous materials to less-than-significant levels. Implementation of the objectives in the Riverside County General Plan with regard to toxic substances required that the safe handling, disposal, and cleanup of toxic substances be implemented in compliance with federal, state, and regional programs and regulations.

Approved Project Mitigation Measures

4.11-1 Users of household hazardous materials such as paints, roofing materials and solvents during construction shall comply with applicable federal, state, and local regulation requiring elimination and reduction of waste at the source by prevention of leakage, by segregation of hazardous waste, and by process of materials change.

4.11-2 All site improvements not removed from the property by the current owner shall be disposed of offsite, in accordance with current local, state, and federal disposal regulations. Any petroleum contaminated materials, lead-based paints or products, mercury, asbestos containing materials and/or buried trash/debris encountered during removal and/or grading shall be evaluated by an experienced environmental consultant prior to removal.

4.11-3 In the event that any subsurface hazardous materials are found during grading or construction, including soil and/or groundwater contamination, all activity in the area of discovery and/or in an appropriate radius of the area of discovery shall temporarily cease and the County of Riverside Environmental Health Department shall be notified prior to the resumption of any

construction activity in the area of discovery, the site shall be deemed safe by the appropriate entity prior to the resumption of grading and/or constructions activities.

4.11-4 If soil is to be imported or exported to or from the site during grading or other construction activities, it the transported soil shall be sampled for contaminates prior to use or disposal. Exported soil, if contaminated, shall be handled in accordance with prevailing environmental laws and regulations, including Land Disposal Restrictions, if applicable.

4.11-5 Prior to the issuance of grading permits, soil sampling shall occur to identify levels of methane, pesticides, herbicides, fertilizer, and other agricultural chemicals. Methane and chemical levels shall be verified to be within allowable limits as regulated by prevailing environmental laws and regulations prior to the issuance of building permits.

Proposed Project Impact Analysis

The Phase I Environmental Site Assessment that was prepared for the Proposed Project found potential for elevated pesticide levels on the Project Site due to its historical use as agricultural land and recommended further investigation (Hillman Consulting 2017). Twenty-four soil samples were collected and analyzed for organochlorine pesticides (OCPs), Title 22 metals, and polycyclic aromatic hydrocarbons (PAHs). All OCPs and PAHs analyzed were below the detection level. Low concentration of various metals were detected but these were all well below the California Human Health Screening Levels set by the Department of Toxic Substances Control. Due to these results, the historical use of the Project Site as agricultural land is not considered to be a recognized environmental condition in connection with the Project Site. Implementation of Mitigation Measures 4.11-1 through 4.11-5 would still be required to reduce potential Project impacts to less-than-significant levels.

Preliminary evaluations for ASTM "Non-Scope" items, such as asbestos-containing materials (ACM), lead-based paint, radon, mold, and wetlands was also performed; however, observations and research did not identify any notable concerns. The Phase I Environmental Site Assessment completed for the Proposed Project revealed no evidence of recognized environmental conditions in connection with the Project Site, including Controlled Recognized Environmental Conditions and Historical Recognized Environmental Conditions (see Appendix H). Therefore, the Proposed Project would result in less-than-significant impacts with mitigation measures, as described below.

Proposed Project Mitigation Measures

The Approved Project mitigation measures are applicable to the Proposed Project as originally adopted and will reduce potential impacts due to toxic substances to less-than-significant levels.

4.11-1 Users of household hazardous materials such as paints, roofing materials and solvents during construction shall comply with applicable federal, state, and local regulation requiring elimination and reduction of waste at the source by prevention of leakage, by segregation of hazardous waste, and by process of materials change.

4.11-2 All site improvements not removed from the property by the current owner shall be disposed of offsite, in accordance with current local, state, and federal disposal regulations. Any petroleum contaminated materials, lead-based paints or products, mercury, asbestos containing materials and/or buried trash/debris encountered during removal and/or grading shall be evaluated by an experienced environmental consultant prior to removal.

4.11-3 In the event that any subsurface hazardous materials are found during grading or construction, including soil and/or groundwater contamination, all activity in the area of discovery and/or in an appropriate radius of the area of discovery shall temporarily cease and the County of Riverside Environmental Health Department shall be notified prior to the resumption of any construction activity in the area of discovery, the site shall be deemed safe by the appropriate entity prior to the resumption of grading and/or constructions activities.

4.11-4 If soil is to be imported or exported to or from the site during grading or other construction activities, it the transported soil shall be sampled for contaminates prior to use or disposal. Exported soil, if contaminated, shall be handled in accordance with prevailing environmental laws and regulations, including Land Disposal Restrictions, if applicable.

4.11-5 Prior to the issuance of grading permits, soil sampling shall occur to identify levels of methane, pesticides, herbicides, fertilizer, and other agricultural chemicals. Methane and chemical levels shall be verified to be within allowable limits as regulated by prevailing environmental laws and regulations prior to the issuance of building permits.

4.1.12 Circulation and Traffic

Approved Project Impact Analysis

The Certified EIR determined that the Approved Project would generate a total of approximately 4,632 trip-ends per day, with 363 vehicles per hour during the AM peak hour and 489 vehicles per hour during the PM peak hour. The Approved Project would contribute vehicle trips to the freeway system, including Interstates 15 and 215. The project's incremental contribution to freeway mainlines was considered a significant cumulative impact. The Approved Project would result in a cumulatively significant impact to intersections identified in Tables 4-11 and 4-12 to the Certified EIR if the approval of other jurisdictions to intersection improvements could not be obtained. The mitigation measures would serve to reduce the direct impacts of the Approved Project on circulation and traffic to less-than-significant levels, but the freeway and potential intersection impact remained cumulatively significant.

The Approved Project would comply with SCAG's Regional Transportation Plan by meeting the anticipated need for roadway improvements. Specifically, the Approved Project proposed to realign and upgrade Wickerd Road from a Secondary (100-foot ROW) roadway to a Major (118-foot ROW) through the TTM 31194 site between Evans Road and Haun Road, and construct that segment. The project's Circulation Element General Plan Amendment (GPA No. 00729) also proposed to reduce Garbani Road from an Urban Arterial to a Secondary between Haun Road and Bradley Road, reduce Garbani Road from a Major to a Collector between Bradley Road and its new terminus east of Evans Road, reduce Bradley Road from a Major to a Secondary

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between Craig Avenue and Garbani Road, and to correct a mapping error to remove an unnamed Secondary between Wickerd Road and Evans Road.

Approved Project Mitigation Measures

4.12-1 Wickerd Road shall be constructed from the easterly project boundary to the westerly project boundary to align with Garbani Road at its ultimate full-section width as a Major roadway.

4.12-2 Garbani Road shall be constructed as a paved two-lane extension from Evans Road to the westerly project to provide site access with a minimum of a 32-foot pavement section.

4.12-3 Wickerd Road shall be constructed as a paved two-lane extension from the easterly project boundary to Haun Road to provide site access with a minimum of a 32-foot pavement section.

4.12-4 Internal roadways shall be constructed as Collector Roadways in accordance with County Transportation Department standards.

4.12-5 On-site traffic signing and striping shall be implemented in conjunction with detailed construction plans for the TTM 31194 site.

4.12-6 Sight distance at each project access roadway shall be reviewed with respect to standard City of Perris, Caltrans, and County of Riverside sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.

4.12-7 The project applicant shall participate in the phased construction of off-site traffic signals through the County's traffic signal fee program.

4.12-8 The project applicant shall participate in funding construction of off-site improvements through payment of Scott Road and Bridge Benefit District (RBBD) fees and Transportation Uniform Mitigation Fees (TUMF).

Proposed Project Impact Analysis

Local access to the Proposed Project would be provided from two points—primary access from Wickerd Road and a secondary access from Garbani Road. All streets within this subdivision are proposed to be public. The Proposed Project is anticipated to generate a total of 5,386 trip-ends per day with 400 AM peak hour trips and 537 PM peak hour trips, which would be an increase from the 4,632 trip-ends per day with 363 vehicles per hour during the AM peak hour and 489 vehicles per hour during the PM peak hour, as stated in the Certified EIR. Additionally, the Certified EIR determined that the Approved Project would contribute vehicle trips to the freeway system, including Interstates 15 and 215. The County General Plan EIR identified segments of I-15 and I-215 as facing a 50 to 100 percent increase in traffic and operating conditions below Level of Service (LOS) D (high-density but stable flow) as a result of General Plan buildout.

Transportation improvements in the City of Menifee are funded through a combination of improvements constructed by the Project, development impact fee programs, or fair share contributions. The Transportation Uniform Mitigation Fee (TUMF) program is administered by the Western Riverside Council of Governments

(WRCOG) based upon a regional Nexus Study most recently updated in 2016 to address major changes in right-of-way acquisition and improvement cost factors. This regional program was put into place to ensure that development pays its fair share, and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region. TUMF is a truly regional mitigation fee program and is imposed and implemented in every jurisdiction in Western Riverside County. The Proposed Project is within the Central TUMF Zone. Additionally, the Proposed Project would be subject to City of Menifee's development impact fee (DIF) program, which includes a component for roads and signals. The City's DIF program was updated in July 2021 and discusses the local (as opposed to regional) streets and signal improvements planned for the city through buildout of the existing city limits. Therefore, as calculated in March 2022, the Project Applicant would be required to pay the resulting fair share cost of $635,642 to the City of Menifee and $5,423 to Caltrans to address the Project's contributions to off-site study area intersections, as shown in Table 2 of the Golden Meadows (TTM No. 31194) Fair Share Assessment (Appendix I). (Note that the fee calculation is as of March 2022 and may change over time. Per ordinance No. 19-268, the fees are paid at the time of building permit issuance.) Compliance with TUMF and DIF would reduce potential transportation impacts that would result from the Proposed Project.

Mitigation Measures 4.12-1 through 4.12-6 would still be required to reduce direct Project impacts on circulation and traffic to less-than-significant levels. In addition, the applicant's participation in Menifee's development impact program will further mitigate the Project's direct impacts on circulation and traffic to less-than-significant levels. For the same reasons as the Approved Project, the Project's impacts on circulation and traffic on freeways and intersections remain cumulatively significant or despite reasonable mitigation measures.

Proposed Project Mitigation Measures

The mitigation measures below have been revised or updated to reflect the change in jurisdictions.

4.12-1 Wickerd Road shall be constructed from the easterly project boundary to the westerly project boundary to align with Garbani Road at its ultimate full-section width as a Major roadway.

4.12-2 Garbani Road shall be constructed as a paved two-lane extension from Evans Road to the westerly project to provide site access with a minimum of a 32-foot pavement section.

4.12-3 Wickerd Road shall be constructed as a paved two-lane extension from the easterly project boundary to Haun Road to provide site access with a minimum of a 32-foot pavement section.

4.12-4 Internal roadways shall be constructed as Collector Roadways in accordance with ~~County Transportation Department~~ the City of Menifee Public Works Department standards.

4.12-5 On-site traffic signing and striping shall be implemented in conjunction with detailed construction plans for the Project Site.

4.12-6 Sight distance at each project access roadway shall be reviewed with respect to standard City of Menifee, City of Perris, Caltrans, and County of Riverside sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.4.12-7The

project applicant shall participate in the phased construction of off-site traffic signals through the City's development impact fee program.

4.12-8 The project applicant shall participate in funding construction of off-site improvements through Transportation Uniform Mitigation Fees (TUMF).

4.12-9 Based on the traffic signal warrant analysis, the intersection of Haun Road and Wickerd Road would warrant a traffic signal after the 275th residential dwelling unit.

4.1.13 Air Quality

Approved Project Impact Analysis

The Certified EIR determined that short-term emissions during construction of the Approved Project would be significant for NOx (construction equipment exhaust), PM-10 (construction dust) emissions, and VOCs (architectural surface coatings). Such emissions included on-site generation of dust and equipment exhaust as well as off-site emissions from construction, employee commuting, and/or trucks delivering building materials. Cumulative long-term emissions were significant for CO (carbon monoxide)(mobile source emissions).

According to the Certified EIR, the greatest project-related air quality concern centered on the 4,632 new vehicle trips that would be generated at completion of the Approved Project. For typical Riverside County trip lengths (approximately 7.5 miles), additional vehicle travel from project implementation would be 35,500 vehicle miles traveled (VMT). Project-related emissions were below the SCAQMD standards for all emission levels except VOCs during the opening year (2007) of the Approved Project. This was regarded as a short-term significant impact on air quality. In addition, the Approved Project contributed to the non-attainment of federal air quality standards in the South Coast Air Basin.

The Certified EIR found that mitigation measures 4.13-1 through 4.13.5 would reduce the impact of the Project on air quality resulting from PM-10 and VOC to less-than-significant levels. However, the Certified EIR found that impacts of NOx, and CO were cumulatively significant and unmitigable with reasonable mitigation measures. The Certified EIR found no feasible, project specific mitigation for long-term CO emissions was available.

Approved Project Mitigation Measures

Construction Activities

4.13-1 Prior to the issuance of grading permits, the owner/permittee shall submit an accelerated construction dust abatement management program to the County of Riverside. This involves developing a dust control program to supplement the routine watering that constitutes best available control measures (BACM's) in excess of any minimum SCAQMD Rule 403 requirements. BACM's that may be adopted and integrated into an enhanced dust control program might include hydroseeding previously disturbed areas while awaiting construction, adding chemical binders or surfactants to increase the effectiveness of watering, and/or early paving or chip sealing of roads. Soil disturbance should be terminated when high winds (>25 mph) make dust control extremely difficult.

4.13-2 The project applicant/contractor shall reduce "spill-over" effects by preventing soil erosion, washing dirt from vehicles entering public roadways, and washing/sweeping project access to public roadways on a regular schedule.

4.13-3 All trucks hauling dirt, sand, soil, or other loose materials are to be covered or shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114.

Construction Emissions (NOx)

4.13-4 (A) Prior to construction commencement for each phase of the proposed development, emissions control from on-site equipment through a routine mandatory program of low emissions tune-ups shall be required.

(B) Electric or natural gas powered construction equipment shall be used as feasible as determined by the construction superintendent. Diesel-powered

(C) During construction, electricity should be used from power poles instead of from portable generators as feasible as determined by the construction superintendent.

Volatile Organics (VOC)

4.13-5 The application of architectural surface treatments (i.e., paint, etc.) shall be limited to 100 gallons per day over the project buildout lifetime using the most currently required low-VOC paint (100 grams or less of VOC per liter) and high pressure-low volume (HPLV) paint applicators.

Proposed Project Impact Analysis

Similar to the Approved Project, short-term emissions would occur during buildout of the Proposed Project. Such emissions include on-site generation of dust and equipment exhaust, and off-site emissions from construction, employee commuting, and/or trucks delivering building materials be significant for NOx (construction equipment exhaust), PM-10 (construction dust) emissions, and VOC (architectural surface coatings); and cumulative long-term emissions would be significant for CO (carbon monoxide)(mobile source emissions). Implementation of Mitigation Measures 4.13-1 through 4.13-5 would still be applicable to the Proposed Project, and would continue to reduce impacts due to construction-related PM10 and VOC emissions to a less-than-significant level. However, reasonable project-specific mitigation measures for NOx, and CO (long-term mobile source emissions) would not reduce the level of "excess" cumulative emissions to below the SCAQMD threshold; thus, NOx, and CO mobile source emissions impact would remain cumulatively significant. No feasible, project specific mitigation for long-term CO emissions is available. While the Proposed Project would result in 98 additional dwelling units within Phase 4 of the Proposed Project, no new significant impacts or substantial increase in severity of impacts would occur with the development of the Proposed Project when compared to the Approved Project.

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Proposed Project Mitigation Measures

The mitigation measures from the Certified EIR have been revised or updated to reflect the change in jurisdictions.

Construction Activities

4.13-1 Prior to the issuance of grading permits, the owner/permittee shall submit an accelerated construction dust abatement management program to the ~~County of Riverside~~ City of Menifee. This involves developing a dust control program to supplement the routine watering that constitutes best available control measures (BACM) in excess of any minimum SCAQMD Rule 403 requirements. BACMs that may be adopted and integrated into an enhanced dust control program might include hydroseeding previously disturbed areas while awaiting construction, adding chemical binders or surfactants to increase the effectiveness of watering, and/or early paving or chip sealing of roads. Soil disturbance should be terminated when high winds (>25 mph) make dust control extremely difficult.

4.13-2 The project applicant/contractor shall reduce "spill-over" effects by preventing soil erosion, washing dirt from vehicles entering public roadways, and washing/sweeping project access to public roadways on a regular schedule.

4.13-3 All trucks hauling dirt, sand, soil, or other loose materials are to be covered or shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114.

Construction Emissions (NOx)

4.13-4 (A) Prior to construction commencement for each phase of the proposed development, emissions control from on-site equipment through a routine mandatory program of low emissions tune-ups shall be required.

(B) Electric or natural gas powered construction equipment shall be used as feasible as determined by the construction superintendent. Diesel-powered

(C) During construction, electricity should be used from power poles instead of from portable generators as feasible as determined by the construction superintendent.

Volatile Organics (VOC)

4.13-5 The application of architectural surface treatments (i.e., paint, etc.) shall be limited to 100 gallons per day over the project buildout lifetime using the most currently required low-VOC paint (100 grams or less of VOC per liter) and high pressure-low volume (HPLV) paint applicators.

4.1.14 Noise

Approved Project Impact Analysis

Construction-Related Impacts

The Certified EIR determined that construction activities, especially heavy equipment, would create short-term noise increases near the TTM 31194 site. Because portions of the TTM 31194 site are underlain with hard rock deposits (undifferentiated Granitic Bedrock), blasting, and rock-crushing could be necessary to achieve suitable development pads. Blasting and crushing could create noise and vibration impacts in excess of typical heavy equipment operations impacts.

Noise impacts would be significant if they caused a violation of any adopted standards. The Riverside County standards for stationary source noise impacts required that the project not produce noise levels that caused the exterior noise environment at any surrounding property with a habitable dwelling to exceed 65 dBA Leq between the daylight hours of 7:00 a.m. and 10:00 p.m. and by 45 dBA Leq between the hours of 10:00 p.m. and 7:00 a.m. However, short-term construction activities are exempt from compliance with numerical noise ordinance standards if the activity occurs during less noise-sensitive hours. Construction noise impacts were thus minimized by time restrictions placed on grading permits. In compliance with County Ordinance No. 457.84, these time limits created a less-than-significant temporary noise impact during construction activities.

Operational Impacts

Completion of the Approved Project resulted in project-related traffic that caused an incremental increase in noise levels throughout the Menifee Valley area. Traffic noise impacts are generally analyzed both to ensure that the project will not adversely impact the acoustic environment of the surrounding community, as well as to insure that the TTM 31194 site is not exposed to an unacceptable level of noise resulting from the ambient noise environment acting upon the project. Development projects in the county were required to comply with County standards for roadway traffic noise mitigation. These standards are based upon the design capacity for a given type of roadway.

Approved Project Mitigation Measures

Short-Term Construction Impacts

4.14-1 Construction activities shall comply with County Noise Ordinance No. 457, relating to construction noise.

4.14-2 Construction shall be restricted to the hours of 7 AM – 5 PM weekdays and Saturdays.

4.14-3 If blasting, drilling or rock crushing occur within 800 feet of any occupied residence, temporary noise barriers (berms, walls, etc.) shall be erected to mitigate noise from these activities to an exterior noise level of 65 dB(A) or less at the nearest residential lot line.

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4.14-4 Prior to any blasting operations, all residences within 800 feet of any potential blast location shall be notified in writing of the blasting schedule, and again within a minimum of 72 hours in advance of blasting.

4.14-5 All construction vehicles or equipment, whether fixed or mobile, shall be equipped with properly operating and maintained mufflers.

4.14-6 Stockpiling and/or vehicle staging areas shall be located as far as practical from occupied residences.

Long-Term Potential Noise Impacts

4.14-7 Prior to the issuance of occupancy permits for affected lots, solid barriers (walls, berms or a combination thereof) shall be provided in the following locations:

a. 7.5-foot high masonry block walls or combination berm and block wall shall be constructed along Lots 218 to 220 and 229 to 239 on Wickerd Road.

b. 7-foot high masonry block walls or combination berm and block wall shall be constructed along Lots 1 to 6, 51 to 69, 71, 72, 83 to 85, 162 to 168, 292, 293, 304, 305, 313, 314, and 320 to 326 on Wickerd Road.

c. 6-foot high masonry block wall/privacy wall or combination berm and block wall shall be constructed along Lots 391 to 403 on Evans Road.

d. Corner Wrap Around and Open Space Lots masonry block walls or combination berm and block wall shall be constructed along those lots along Wickerd Road that have been identified in the County's review of the acoustical analysis. The height shall be determined by the adjacent wall height. These walls shall be erected so that the top of each wall extends at least 6 to 7.5 feet (depending on location) above the pad elevation of the shielded lot. In cases where the road is elevated above the pad, the wall shall extend at least 6 to 7.5 feet (depending on location) above the highest point between the homes and the road. Final noise barrier heights should be determined when final grading plans show lot location, precise road, and pad elevations.

4.14-8 Mechanical ventilation (e.g. air conditioning) shall be provided for all homes located adjacent to Wickerd Road and Evans Road.

4.14-9 Upgraded windows with a Sound Transmission Class (STC) rating 30 or higher shall be installed in all homes located adjacent to Wickerd Road.

4.14-10 To minimize the potential interior noise impacts, homes facing Wickerd Road and Evans Road should be provided with weather-stripped solid core exterior doors and exterior wall/roof assembles free of cut-outs and openings.

4.14-11 Prior to issuance of building occupancy permits, the applicant shall provide the County of Riverside Department of Public Health with an interior acoustical report for review and approval. The report must demonstrate that the interior noise of those homes along Wickerd Road and Evans Road has been reduced to at or below 45 Ldn.

Proposed Project Impact Analysis

Construction-Related Impacts

Similar to the Approved Project, construction activities during the development of the Proposed Project, especially heavy equipment, would create short-term noise increases near the Project Site. Since the Proposed Project would be within the same footprint as the Approved Project, portions of the Project Site are still underlain with hard rock deposits (undifferentiated Granitic Bedrock); thus, blasting and rock-crushing may be necessary to achieve suitable development pads. Blasting and crushing may create noise and vibration impacts in excess of typical heavy equipment operations impacts.

Noise impacts would be significant if they caused a violation of any adopted standards. The City of Menifee standards for stationary source noise impacts require that the project must not produce noise levels that cause the exterior noise environment in any surrounding property that contains a habitable dwelling to exceed 55 dBA Leq between the daylight hours of 7:00 a.m. and 10:00 p.m. and by 50 dBA Leq between the hours of 10:00 p.m. and 7:00 a.m. In accordance with Title 5, Section 5-2-5, of the Menifee Municipal Code, no person shall engage in, cause or permit any person to be engaged in construction activities in any residential or commercial district between the hours of 9:00 pm of one day and 6:00 am of the following day. Additionally, no person shall operate or permit to be operated on any private property, or on the public way within any residential or commercial district(s), any power equipment used for home or building repair or grounds maintenance, or any construction equipment used for construction activities, between the hours of 10:00 pm of one day and 7:00 am of the next day. Such power equipment shall include, but not be limited to, lawn mowers, garden tools, snow removal equipment, electric or chain saws, pavement breakers, log chippers, riding tractors, or powered hand tools.

Operational Impacts

As with the Approved Project, completion of the Proposed Project would result in project-related traffic which would cause an incremental increase in areawide noise levels throughout the Menifee Valley area. Traffic noise impacts are generally analyzed both to insure that the project will not adversely impact the acoustic environment of the surrounding community, as well as to insure that the Project Site is not exposed to an unacceptable level of noise resulting from the ambient noise environment acting upon the project.

Proposed Project Mitigation Measures

Short-Term Construction Impacts

4.14-1 Construction activities shall comply with ~~County Noise Ordinance No. 457~~ Menifee Municipal Code Section 8.01.101, relating to construction noise.

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4.14-2 Construction shall be restricted to the hours of ~~7 AM – 5 PM~~ 6:30 am to 7:00 pm weekdays and Saturdays.

4.14-3 If blasting, drilling or rock crushing occur within 800 feet of any occupied residence, temporary noise barriers (berms, walls, etc.) shall be erected to mitigate noise from these activities to an exterior noise level of 65 dB(A) or less at the nearest residential lot line.

4.14-4 Prior to any blasting operations, all residences within 800 feet of any potential blast location shall be notified in writing of the blasting schedule, and again within a minimum of 72 hours in advance of blasting.

4.14-5 All construction vehicles or equipment, whether fixed or mobile, shall be equipped with properly operating and maintained mufflers.

4.14-6 Stockpiling and/or vehicle staging areas shall be located as far as practical from occupied residences.

Long-Term Potential Noise Impacts

4.14-7 Prior to the issuance of occupancy permits for affected lots, solid barriers (walls, berms or a combination thereof) shall be provided in the following locations:

a. 7.5-foot-high masonry block walls or combination berm and block wall shall be constructed along Lots 61-63 and 72-84 of TTM 31194-1 on Wickerd Road.

b. 7-foot-high masonry block walls or combination berm and block wall shall be constructed along Lots 3-4, 15-16, 24-25, 31-32, of TTM 31194-1, Lots 1, 3-7 of TTM 31194-2 and Lots 1-4, 114-138 and 251-259 of TTM 31194-4 on Wickerd Road.

c. 6-foot-high masonry block wall/privacy wall or combination berm and block wall shall be constructed along Lots 31-43 of TTM 31194-3 on Evans Road.

d. **Corner Wrap Around and Open Space Lots.** Masonry block walls or combination berm and block wall shall be constructed along those lots along Wickerd Road that have been identified in the County's review of the acoustical analysis. The height shall be determined by the adjacent wall height. These walls shall be erected so that the top of each wall extends at least 6 to 7.5 feet (depending on location) above the pad elevation of the shielded lot. In cases where the road is elevated above the pad, the wall shall extend at least 6 to 7.5 feet (depending on location) above the highest point between the homes and the road. Final noise barrier heights shall be determined when final grading plans show lot location, precise road, and pad elevations.

4.14-8 Mechanical ventilation (e.g., air conditioning) shall be provided for all homes adjacent to Wickerd Road and Evans Road.

4.14-9 Upgraded windows with a Sound Transmission Class (STC) rating 30 or higher shall be installed in all homes adjacent to Wickerd Road.

4.14-10 To minimize the potential interior noise impacts, homes facing Wickerd Road and Evans Road shall be provided with weather-stripped, solid-core exterior doors and exterior wall/roof assemblies free of cut-outs and openings.

4.14-11 Prior to issuance of building occupancy permits, the applicant shall provide the City of Menifee Building and Safety Department with an interior acoustical report for review and approval. The report must demonstrate that the interior noise of those homes along Wickerd Road and Evans Road has been reduced to or below 45 Ldn.

4.1.15 Open Space, Parks, and Recreation

Approved Project Impact Analysis

The Certified EIR determined that the open space and recreation plan for the Approved Project provided for approximately 51.1 acres (25 percent) of the TTM 31194 site to be set aside for natural open space. Additionally, 6.4 acres were allocated to neighborhood parks. Overall, approximately 60.7 acres (29 percent of the entire TTM 31194 site) was devoted to open space and recreational uses.

It was anticipated that existing regional recreational facilities, such as the regional parks and state recreation areas, provided ample regional recreational uses for residents of the Approved Project. The TTM 31194 site was identified by the County General Plan for residential use and was not designated to meet regional parkland needs.

Typically, the County required 5.0 acres of parkland for each 1,000 residents to satisfy Quimby Act standards, as expressed in Ordinance No. 460, Section 10.35. Based on Riverside County Ordinance No. 460, Section 10.35, and State Quimby Act requirements, 36.35 acres of open space and 7.3 acres of neighborhood/community parkland were required to support residents of the Approved Project. The Approved Project proposed 54.3 acres of open space and 6.4 acres of parkland to meet these requirements. Also, passive walking trails were proposed along the central drainage area to further increase recreational opportunities. However, the proposed 6.4 acres of neighborhood park space was 0.9 acre less than what was required. Mitigation Measure 4.15-1 reduced potential impacts to less-than-significant.

Approved Project Mitigation Measures

4.15-1 The project applicant shall be required to pay an in-lieu park fee to the County for its 0.9-acre park deficiency prior to the issuance of building permits.

Proposed Project Impact Analysis

As shown in Table 1, *Proposed Project Lots*, in Section 3.1 of this Addendum, the Proposed Project would include approximately 3.69 acres of parkland and approximately 41.30 acres of open space within the Project Site. The City of Menifee has approximately 132 acres of developed park and recreation facilities (Menifee 2013). In

addition to city parks, regional parks in Riverside County provide recreational opportunities for Menifee residents.

As stated in the City's General Plan EIR, proposed projects would be required to comply with the Quimby Act, California Government Code Section 66477, which requires the dedication of land and/or fees for park and recreational purposes as a condition of approval of a tentative map or parcel map. The City of Menifee has a standard of 5 acres of parkland per 1,000 persons. The Proposed Project is anticipated to have a population of approximately 803 residents and would be required to dedicate approximately 1.3 acres for park and recreational purposes. As stated above, the Proposed Project would include approximately 45.66 acres of parkland and open space. Thus, as stated in the General Plan, development fees would not be required for the Proposed Project, in accordance with the Quimby Act. The proposed project would not have an adverse physical impact on any parks or necessitate the construction of new parks. The proposed project would include its own recreation facilities and an outdoor play area to serve the residents. The proposed project would not result in the need for new or expanded park facilities and there would be no impact to park facilities. The Proposed Project would have a less-than-significant impact on open space, parks, and recreation, and no mitigation measures are required.

Proposed Project Mitigation Measure

4.15-1 The project applicant shall be required to pay an in-lieu park fee to the City of Menifee for park deficiency prior to the issuance of building permits.

4.1.16 Fire Protection

Approved Project Impact Analysis

The Certified EIR determined that the development of 486 housing units proposed by the Approved Project would place additional demand on the County Fire Department and cumulatively impact the Department's ability to service the planned population. Because an existing fire station is already located within 3 miles of the site (Station 68), the Fire Department would be able to respond with a full first alarm assignment operating on the scene of a fire within 15 minutes of dispatch upon completion of roadway improvements proposed by the Approved Project (Urban-Category III level of service). With buildout of the Approved Project, however, a significant cumulative impact on fire services was identified due to the additional demand being placed on fire protection services in the project area. The Approved Project would comply with the provisions in the Uniform Fire Code and Riverside County Code, Chapter 8.32, Fire Protection Regulations, and implement Mitigation Measures 4.16-1 and 4.16-5, which reduced cumulative impacts to below a level of significance.

Approved Project Mitigation Measures

4.16-1 In accordance with Riverside County Subdivision Ordinance 460, fire flows shall have 1000 gallons per minute at 20 psi residual pressure.

4.16-2 All water mains and fire hydrants shall be constructed in accordance with Ordinance 460. Hydrant spacing at each intersection shall be no more than 330 feet apart.

4.16-3 Disclosures of potentially damaging wildfires in the area must be disclosed to future homebuyers by the seller as part of the buyer disclosure statements prior to purchase as required by the California Civil Code.

4.16-4 Prior to issuance of the grading permits, a fire protection/vegetation management plan shall be prepared and submitted to the Fire Department for review and approval.

4.16-5 Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the County Development Impact Fee (DIF) Ordinance (Ord. No. 659), which requires a fee payment that the County applies to the funding of public facilities, including fire protection facilities.

Proposed Project Impact Analysis

As described in Section 3.3, Phase 4 of the residential development would result in approximately 98 additional dwelling units for a total of 259 dwelling units, compared to 161 units proposed by the Approved Project. This would increase the overall number of dwelling units from 486 to 571 (including Phases 1 to 3). The City contracts with Riverside County Fire to provide fire services in the City. Similar to the Approved Project, the Proposed Project is within 3 miles of an existing fire station (Station 68 at 26020 Wickerd Road), which would allow the Fire Department to respond with a full first alarm assignment operating on the scene of a fire within 15 minutes of dispatch after completion of roadway improvements proposed by the Proposed Project (Urban-Category III level of service). However, buildout of the Proposed Project would still have a significant cumulative impact on fire services due to the additional demand on fire protection services in the project area. The Proposed Project would comply with the provisions in the International Fire Code and Riverside County Code Chapter 8.32, Fire Protection Regulations, which would reduce cumulative impacts, and implementation of Mitigation Measures 4.16-1 through 4.16-5 would still be required to reduce the impact of the Proposed Project, including the additional 98 residential units, on fire protection to less-than-significant levels.

Proposed Project Mitigation Measures

The Approved Project mitigation measures are applicable to the Proposed Project as originally adopted.

4.16-1 In accordance with Riverside County Subdivision Ordinance 460, fire flows shall have 1,000 gallons per minute at 20 psi residual pressure.

4.16-2 All water mains and fire hydrants shall be constructed in accordance with Ordinance 460. Hydrants at each intersection shall be no more than 330 feet apart.

4.16-3 Disclosures of potentially damaging wildfires in the area must be disclosed to future homebuyers by the seller as part of the buyer disclosure statements prior to purchase as required by the California Civil Code.

4.16-4 Prior to issuance of the grading permits, a fire protection/vegetation management plan shall be prepared and submitted to the Fire Department for review and approval.

4.16-5 Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the County Development Impact Fee (DIF) Ordinance (Ord. No. 17-232), which requires a fee payment that the County applies to the funding of public facilities, including fire protection facilities.

4.1.17 Sheriff (Police) Protection

Approved Project Impact Analysis

The Certified EIR determined that the Approved Project would contribute incrementally to population growth in the region, which could result in an incremental increase in criminal activity such as burglaries, thefts, auto thefts, vandalism, etc. According to the Riverside Sheriff's Department, there is no direct correlation between population growth, the number of crimes committed, and the number of Sheriff's Department personnel needed to respond to these increases. As the population and use of an area increase, however, additional financing of equipment and manpower are required to meet the increased demand. The Approved Project increased the demand for services beyond the capabilities of the Riverside Sheriff's Department. To obtain a desirable level of service, using the criterion of one deputy per 1,000 residents, ultimate development of the Approved Project could generate a need for one additional deputy in order to provide adequate protection to the TTM 31194 site. Staff necessary to support the additional deputy would include an appropriate level of civilian, investigation, and supervisory personnel. Development of the Approved Project required implementation of Mitigation Measures 4.17-1 and 4.17-2 to ensure that potential impacts were less-than-significant.

Approved Project Mitigation Measures

4.17-1 Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the County Development Impact Fee (DIF) Ordinance (Ord. No. 659), which requires a fee payment that the County applies to the funding of public facilities, including sheriff protection facilities.

4.17-2 The project applicant shall inform the Crime Prevention Unit of the Sheriff's Department of all new homeowners associations. These associations may be used as the foundation for establishing Neighborhood Watch Programs.

Proposed Project Impact Analysis

As described in Section 3.3, Phase 4 of the residential development would result in approximately 98 additional dwelling units and a total of 259 dwelling units, compared to 161 units proposed by the Approved Project. This would increase the overall number of proposed dwelling units from 486 to 571 (including Phases 1 to 3). In accordance with the City of Menifee General Plan's future buildout projections, the Proposed Project would be anticipated to result in a population of approximately 803 residents in the 259 dwelling units, and the TTM 31194 site (including Phases 1 to 3) is anticipated to result in a population of approximately 1,770 residents in the 571 proposed dwelling units. Development of the Proposed Project could contribute incrementally to population growth in the region, which could result in an incremental increase in criminal activity such as burglaries, thefts, auto thefts, vandalism, etc.; thus, the Proposed Project would result in an increase in the

demand for services beyond the current capabilities of the City of Menifee's Police Department. Development of the Proposed Project would require implementation of Mitigation Measures 4.17-1 and 4.17-2, which would fee allow more police staff and infrastructure, and neighborhood watch, reducing demand on police. Therefore, implementation of the mitigation measures would ensure that potential project impacts would be less-than-significant.

Proposed Project Mitigation Measures

4.17-1 Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the ~~County~~ City's Development Impact Fees (DIF) Ordinance (Ord. ~~No. 659~~ No. 17-232), which requires a fee payment that the City applies to the funding of public facilities, including ~~sheriff~~ police protection facilities.

4.17-2 The project applicant shall inform the ~~Crime Prevention Unit of the Sheriff's Department~~ Problem Oriented Policing (POP) Unit of the City of Menifee's Police Department of all new homeowners associations. These associations may be used as the foundation for establishing Neighborhood Watch Programs.

4.1.18 Solid Waste

Approved Project Impact Analysis

The Certified EIR determined that the Approved Project would increase the amount of solid waste generated in the area, shortening the life span of the affected landfills and increasing the demand on waste haulers. The Approved Project included a total of 486 dwelling units and would generate approximately 0.41 tons of solid waste per capita per year—that is, approximately 599.83 tons per year or 1.6 tons per day. Implementation of a waste disposal strategy for the Approved Project could assist Riverside County in achieving the mandated goals of the Integrated Waste Management Act by developing feasible waste programs that encourage source reduction, recycling, and composting.

The County Solid Waste Management Plan includes programs to reduce the quantities of waste sent to landfills. These programs include source reduction, separation of recoverables, composting, and high technology resources recovery. The implementation of these programs reduced the increase in solid waste generation associated with new development, which would aid in extending the life of affected disposal sites. With project participation in a recycling program, direct impacts to landfill capacity would not be significant.

Approved Project Mitigation Measures

4.18-1 The refuse hauler for the TTM 31194 site shall be advised of the efforts the developer will be pursuing relating to recycling and waste reduction (i.e., curbside recycling, in accordance with County Resolution No. 90-688. The use of such programs would be encouraged by the developer through information (e.g., location, materials accepted, etc.) provided in sales literature.

4.18-2 The project applicant shall participate in established County-wide programs to reduce solid waste generation.

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4.18-3 The master Homeowners' Association and/or landscape maintenance district or association shall either mulch (shred and leave on landscaped areas), compost on-site, or separate from other types of waste to send to a composting facility within the local area, green waste (i.e., trimmings from grass, shrubs, or trees) from common project landscaped areas and the community park.

4.18-4 The project developer shall pursue and implement any available and feasible source reduction programs for the disposal of construction materials to the satisfaction of the Riverside County Waste Management Department.

4.18-5 The project applicant shall comply with the State Model Ordinance, which requires adequate areas for the collection and loading of recyclable materials to be provided within detached, single family residential areas where solid waste is collected and loaded in a location which serves five or more units.

Proposed Project Impact Analysis

During construction of the Proposed Project, a waste recycling plan (WRP) would be submitted to the City's Public Works/Engineering Department for review and approval. The WRP would include the waste materials (concrete, asphalt, wood, etc.) that would be generated by the construction activity associated with this development and the projected amounts of each material; the measures/methods that would be taken to recycle, reuse, and/or reduce the amount of waste materials generated; the facilities and/or haulers that would be utilized; and the targeted recycling or reduction rate. During construction of the Proposed Project, the Project Site would have a minimum of two bins—one for waste disposal and the other for the recycling construction and demolition (C&D) materials. Additional bins are encouraged for further source separation of C&D recyclable materials.

As described in Section 3.23 Phase 4 of the residential development would result in a total of 259 dwelling units and is anticipated to result in a population of approximately 803 residents. This would increase the overall number of proposed dwelling units to 571 (including Phases 1 to 3), which would result in an estimated overall population of approximately 1,770 residents. The Proposed Project would generate approximately 0.41 ton of solid waste per capita per year, resulting in approximately 239.44 tons per year or 0.66 tons per day for Phase 4 of the residential development. Additionally, the entire TTM 31194 site would result in approximately 742.1 tons per year or 2.03 tons per day, compared to 599.83 tons per year or 1.6 tons per day for the Approved Project.

Solid waste from the Proposed Project would be collected by Waste Management, Inc. (WMI), which provides service to the City of Menifee. Residences within the Proposed Project would be provided three bins—one for trash, one for green waste, and one for recyclable materials. Solid waste from Menifee is disposed of in two landfills, El Sobrante Landfill in unincorporated Riverside County south of the City of Corona, and Badlands Sanitary Landfill near the City of Moreno Valley.

Proposed Project Mitigation Measures

The mitigation measures from the Certified EIR ensure that the Proposed Project would have less-than-significant impacts on solid waste; some have been revised to reflect the change in jurisdictions.

4.18-1 The refuse hauler for the Project Site shall be advised of the efforts the developer will be pursuing relating to recycling and waste reduction (e.g., curbside recycling) in accordance with ~~County Resolution No. 90-688~~ Chapter 6.30, Solid Waste Disposal and Organic Waste Diversion, of the Menifee Municipal Code. The use of such programs would be encouraged by the developer through information (location, materials accepted, etc.) provided in sales literature.

4.18-2 The project applicant shall participate in established citywide programs to reduce solid waste generation.

4.18-3 The master Homeowners' Association and/or landscape maintenance district or association shall mulch (shred and leave on landscaped areas), compost on-site, or separate from other types of waste to send to a composting facility within the local area, green waste (i.e., trimmings from grass, shrubs, or trees) from common landscaped areas and the community park.

4.18-4 The project developer shall pursue and implement any available and feasible source reduction programs for the disposal of construction materials to the satisfaction of the ~~Riverside County Waste Management Department~~ City of Menifee's Solid Waste and Recycling Department.

4.18-5 The project applicant shall comply with the State Model Ordinance, which requires adequate areas for the collection and loading of recyclable materials to be provided within detached, single family residential areas where solid waste is collected and loaded in a location which serves five or more units.

4.1.19 Water and Wastewater Services

Approved Project Impact Analysis

The Certified EIR determined that the water system for the Approved Project would be connected to the EMWD water system at the intersection of Garbani Road and Haun Road with an additional water main at the intersection of Wickerd Road and Haun Road. The pressure available from the existing water system was adequate to provide residual pressures greater than 20 psi during 1,500 gpm fire flows, as required by EMWD. The minimum residual pressure experienced for the worst-case fire flow was 30.2 psi for the Wickerd Road connection. The proposed water system provided greater than 40 psi for all lots during a peak-hour domestic demand event. The minimum pressure experienced was 41.8 psi.

Sewer lines would be installed on- and off-site to connect to an existing line in Bradley Road. Off-site connections would be installed to the north through TTM No. 30142 and in Evans Road, Carson Avenue,

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Murphy Lane, Holland Road, and through private property to a connection point at Bradley Road. Off-site sewer connections to the north were the responsibility of TTM No. 30142.

The Approved Project had a calculated average wastewater discharge of 178,605 gallons per day. This was based on an average daily flow of 367.5 gallons per day (gpd) per dwelling unit

Approved Project Mitigation Measures

The Approved Project provided the water and wastewater facilities necessary to serve the project. It was required to be in compliance with the basin plan of the Santa Ana RWQCB. In addition, the project was required to obtain updated "will serve" letters from the EMWD before subdivision or use permit implementation. The Approved Project was conditioned to construct an on-site recycled water system and associated off-site recycled water facilities that provided a nonpotable water source for irrigating common landscaped areas such as green-belts and open space areas. Therefore, the Approved Project did not result in any significant impacts to water or wastewater facilities, and no mitigation measures were required beyond the standard conditions imposed by the County of Riverside.

Proposed Project Impact Analysis

Similar to the Approved Project, the Proposed Project would be connected to the EMWD water system. The pressure available from the existing water system is adequate to provide residual pressures greater than 20 psi during 1,500 gpm fire flows, as required by EMWD. The minimum residual pressure experienced for the worst-case fire flow was 30.2 psi for the Wickerd Road connection. The proposed water system provides greater than 40 psi for all lots during a peak-hour domestic demand event. The minimum pressure experienced was 41.8 psi. Sewer lines for the Proposed Project would be installed on- and off-site to connect to an existing. The Proposed Project would have a calculated average wastewater discharge of 95,183 gallons per day based on an average daily flow of 367.5 gallons per day (gpd) per dwelling unit; and the TTM 31194 project would have a calculated average wastewater discharge of 209,844 gallons per day.

The Proposed project provides the water and wastewater facilities necessary to serve the project. It is required to be in compliance with the basin plan of the Santa Ana RWQCB. In addition, the Proposed Project required to obtain updated "will serve" letters from the EMWD before subdivision or use permit implementation. The Proposed Project is conditioned to construct an on-site recycled water system and associated off-site recycled water facilities that provided a nonpotable water source for irrigating common landscaped areas such as green-belts and open space areas. Therefore, the Proposed Project will not result in any significant impacts to water or wastewater facilities, and no mitigation measures were required beyond the standard conditions imposed by the City and EMWD.

Proposed Project Mitigation Measures

No new mitigation measures would be required for the Proposed Project.

4.1.20 Schools

Approved Project Impact Analysis

The Certified EIR determined that implementation of the Approved Project and construction of 486 single-family residential dwelling units would increase the demand on existing educational facilities and services by generating additional students to be served by the Menifee Unified School District (MUSD) and Perris Union High School District (PUHSD). After applying student generation rates supplied by these school districts, implementation of the Approved Project generated approximately 187 elementary school students, 102 middle school students, and 122 high school students.

According to enrollment numbers supplied by MUSD and PUHSD, the Approved Project would generate students in excess of available capacity at the elementary and middle school levels. Elementary school students would attend Menifee Elementary School which was operating at capacity. Middle school students would attend Menifee Valley Middle School, which was operating at 33 students below capacity.

Two new elementary schools and one new high school were planned in the vicinity of the Approved Project. The MUSD and PUHSD were relieving overcrowding through the use of portable classrooms. The addition of 187 elementary school students and 102 middle school students to over-capacity schools was regarded as a significant cumulative impact. The addition of 122 students to Paloma Valley High School would not result in enrollment over the school's recommended capacity, but nonetheless was regarded as a significant cumulative impact as urbanization continued in the district.

Approved Project Mitigation Measure

4.20-1 Prior to the issuance of each residential building permit(s), school fees shall be paid in accordance with the requirements of the State of California (Senate Bill 50) or the applicant shall enter into a mitigation agreement with the Menifee Union School District and the Perris Union High School District.

Proposed Project Impact Analysis

As described in Section 33, Phase 4 of the residential development would result in a total of 259 dwelling units and a population of approximately 803 residents. This would increase the overall dwelling units to 571 (including Phases 1 to 3) and the overall population to approximately 1,770 residents. The nearest public schools to the Project Site include Oak Meadows Elementary School and Menifee Valley Middle School, which are part of the MUSD, and Paloma Valley High School, which is part of PUHSD (see Table 4, *Student Enrollment and Anticipated Student Generation*).

4. CEQA Analysis

Table 4. Student Enrollment and Anticipated Student Generation

School	Grades Served	Existing Enrollment	Student Generation Rate	Dwelling Units		Number of Students	
				Proposed Project (Phase 4 only)	TTM 31194 Site (including Phases 1–3)	Proposed Project (Phase 4 only)	TTM 31194 Site (including Phases 1–3)
Menifee Union School District							
Oak Meadows Elementary School	K-5	815	0.3119	259	571	81	178
Menifee Valley Middle School	6-8	1,239	0.1525	259	571	39	87
Perris Union High School District							
Paloma Valley High School	9-12	2,919	0.1317	259	571	34	75

Source: California Department of Education 2022; City of Menifee 2013.

According to the City's General Plan EIR, the estimated increase in student generation for single-family residences would be 0.3119 student/unit for elementary school students, 0.1525 student/unit for middle school students, and 0.1317 student/unit for high school students. Thus, an increase to 259 dwelling units for the Proposed Project would result in approximately 81 elementary school students, 39 middle school students, and 34 high school students. The overall TTM 31194 site (including Phases 1 to 3) would have a total of 571 dwelling units and result in approximately 178 elementary school students, 87 middle school students, and 75 high school students. The proposed project would be required to pay school impact fees, pursuant to SB 50, to reduce impacts to the school system. The school districts collect these fees at the time of issuance of building permits. The State legislature has found that funding programs established by SB 50 constitutes "full and complete mitigation of the impacts" on the provision of adequate school facilities (Government Code Section 65995(h)). SB 50 sets forth a state school facilities construction program that includes restrictions on a local jurisdiction's ability to demand mitigation of a project's impacts on school facilities in excess of fees in Education Code 17620. Therefore, the Proposed Project would result in less-than-significant impacts with mitigation measures, as described below.

Proposed Project Mitigation Measures

The Approved Project mitigation measure is applicable to the Proposed Project as originally adopted and will reduce the impact of the Proposed Project on school to less-than-significant levels.

4.20-1 Prior to the issuance of each residential building permit(s), school fees shall be paid in accordance with the requirements of the State of California (Senate Bill 50) or the applicant shall enter into a mitigation agreement with the Menifee Union School District and the Perris Union High School District.

4.1.21 Libraries

Approved Project Impact Analysis

The Certified EIR determined that development of the Approved Project created an additional demand for library facilities and services by generating 1,463 residents (486 homes x 3.01). Although use of the internet had resulted in less demand on library services nationwide, the County continued to maintain its standards for book titles and library square footage. To attain the County's minimum level of service standard of 1.2 titles per capita, the project-generated population required an additional 1,756 book titles. To attain the County of Riverside standard of 0.5 square foot of library space per capita, the project created the demand for an additional 732 square feet of library space. The Riverside County Public Library determined that no additional facilities were required.

Approved Project Mitigation Measures

4.21-1 Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the County Development Impact Fee (DIF) Ordinance (Ord. No. 659), which requires a fee payment that the County applies to the funding of public facilities, including library facilities.

Proposed Project Impact Analysis

The Proposed Project would generate approximately 803 new residents on the Project Site and approximately 1,770 new residents over the entire project (including Phases 1 to 3). Therefore, it would also create an additional demand for library facilities and services. The City of Menifee is served by the Riverside County Public Library system. The Riverside County Public Libraries include three libraries that service the city and are within nine miles of the Project Site—Paloma Valley Library, Sun City Library, and Romoland Library. To attain the County's minimum level of service standard of 1.2 titles per capita, the Project-generated population would require an additional 964 book titles for the Proposed Project and an additional 2,172 titles for the TTM 31194 project (including Phases 1 to 3). To attain the County of Riverside standard of 0.5 square foot of library space per capita, the Project would need approximately 402 square feet of additional library space for the Proposed Project and approximately 905 square feet for the entire Project (including Phases 1 to 3).

The City's General Plan EIR identifies that the existing facilities are not adequate to serve the current population in Menifee and would not be adequate to serve the Proposed Project. However, additional DIFs per City Resolution No. 17-232would be required for the Proposed Project and would contribute to the financing of additional library space and services in the city. With the DIFs, the addition of Project Site residents would not substantially diminish level of service or performance objectives of the library system and will reduce the impact of the Proposed Project on library services to less-than-significant levels.

Proposed Project Mitigation Measures

4.21-1 Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the City Development Impact Fee (DIF)(Resolution No. 17-232), which requires a fee payment that the City applies to the funding of public facilities, including library facilities.

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4.1.22 Healthcare Services

Approved Project Impact Analysis

The Certified EIR determined that adverse impacts to health services were not anticipated as a result of implementation of Approved Project. The increase in population of 1,463 people by the Approved Project (County Ordinance No. 460, Section 10.35) would generate an increased demand for medical services, and therefore result in a significant cumulative impact to health care services. Health care is a regional issue, which generally responds to the current demand. The Certified EIR found that the payment of a County Development Impact Fee pursuant to Ordinance No. 659 to fund public facilities would reduce the impact of the Approved Project on healthcare services to less-than-significant levels.

Approved Project Mitigation Measures

4.22-1 Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the County Development Impact Fee (DIF) Ordinance (Ord. No. 659), which requires a fee payment that the County applies to the funding of public facilities, including public health facilities.

Proposed Project Impact Analysis

Similar to the implementation of the Approved Project, development of the Proposed Project would increase population in the Project area, thus increasing demand for medical services and resulting in a significant cumulative impact to health care services. However, additional DIFs per City Resolution No. 17-232would be required for the Proposed Project and would contribute to the financing of additional healthcare services in the city. With the DIFs, the addition of Project Site residents would not substantially diminish level of service or performance objectives of existing healthcare facilities and will reduce the impact of the Proposed Project on healthcare services to less-than-significant levels. .Therefore, implementation of Mitigation Measure 4.22-1 would be applicable to the Proposed Project and would ensure that potential project impacts regarding healthcare services are reduced.

Proposed Project Mitigation Measures

4.22-1 Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the City Development Impact Fee (DIF)(Resolution No. 17-232), which requires a fee payment that the City applies to the funding of public facilities, including public health facilities.

4.1.23 Energy Resources

Approved Project Impact Analysis

The Certified EIR determined that implementation of the Approved Project would result in the conversion of the site from agricultural and vacant land uses to a residential community, which would increase the demand on available sources of energy. Specifically, the Approved Project increased consumption of energy for motor vehicle movement, space and water heating, lighting, cooking, refrigeration and air conditioning, operation of

construction equipment, use of miscellaneous home appliances, and energy required to produce the construction materials and all other material aspects of the Approved Project. However, the Approved Project was not regarded as an energy-intensive land use; thus, energy consumption levels were not expected to exceed typical requirements for similar urban development. Also, service providers indicated an ability to serve the Approved Project without it significantly affecting their energy resources.

On-site natural gas demand for the Approved Project was estimated at 38,870,280 therms per year based on 79,980 therms per year per dwelling unit. On-site electricity was estimated at 2,956,824 kilowatt-hours per year (kWh/yr.) based on 6,081 kWh/yr. per dwelling unit. The Approved Project would consume energy and have an impact on available energy resources; however, due to long range planning by energy purveyors, the demands related to the Approved Project could be accommodated and impacts were not significant.

Approved Project Mitigation Measures

Impacts were not significant, so mitigation was not required. As a standard condition of approval, the project was required to comply with Titles 20 and 24 of the California Code of Regulations. Title 24, Section 2-5307(b) is the California Energy Conservation Standard for New Buildings, which prohibits the installation of fixtures unless the manufacturer has certified their compliance with flow rate standards to the California Energy Commission (CEC). Title 24, Sections 2-5452(i) and (j) address pipe installation requirements that can reduce water used before it reaches equipment or fixtures. Title 20, Sections 1604(f) and 1606(b), are Appliance Efficiency Standards that set the maximum flow rate of all plumbing fixtures and prohibit the sale of nonconforming fixtures. The Approved Project was also required to adhere to State codes regarding energy conservation.

Proposed Project Impact Analysis

The Proposed Project would be constructed within the same footprint at the Approved Project, so the Proposed Project would also result in the conversion of the TTM 31194 site from agricultural uses and vacant land to a residential community, resulting in an increased demand on existing sources of energy.

On-site natural gas demand for the Proposed Project is estimated at 64,223,940 therms per year based on 79,980 therms per year per dwelling unit. On-site electricity for the Proposed Project is estimated at 3,472,251 kWh/yr. based on 6,081 kWh/yr. per dwelling unit. Similar to the Approved Project, the Proposed Project would consume energy and have an impact on available energy resources; however, due to long range planning by energy purveyors, the demands of the Proposed Project can be accommodated, and impacts are not significant.

Proposed Project Mitigation Measures

Impacts would not be significant, so mitigation is not required. As a standard condition of approval, the Proposed Project would be required to comply with Titles 20 and 24 of the California Code of Regulations. Title 24, California Code of Regulations Section 2-5307(b) is the California Energy Conservation Standard for New Buildings which prohibits the installation of fixtures unless the manufacturer has certified to the California Energy Commission (CEC) compliance with the flow rate standards. Title 24, California Code of Regulations Sections 2-5452(i) and (j) address pipe installation requirements which can reduce water used before hot water

reaches equipment or fixtures. Title 20, California Code of Regulations Sections 1604(f) and 1606(b) are Appliance Efficiency Standards that set the maximum flow rate of all plumbing fixtures and prohibit the sale of non-conforming fixtures. The Proposed Project would also be required to adhere to State codes regarding energy conservation.

4.1.24 Utilities

Approved Project Impact Analysis

Electricity

The Certified EIR determined that the Approved Project would create a demand for electricity and require the extension of electrical facilities to serve project development. New electrical service would be provided by Southern California Edison (SCE), which would install the required electrical transmission lines.

Buildout of the Approved Project was estimated to require approximately 2,955,366 kilowatt hours per year (kWh/yr.). SCE determined that the proposed project would not adversely affect electrical service or demand. The Approved Project was required to implement all relevant energy conservation measures as outlined in Title 24 of the California Code of Regulations.

Natural Gas

The Approved Project generated a demand for natural gas and required the extension of natural gas lines into the TTM 31194 site. The primary use of natural gas by the project was to produce space heating, water heating, and other miscellaneous heating and air conditioning uses.

The Approved Project was estimated to consume approximately 38,870,280 cubic feet per year of natural gas at buildout. Southern California Gas Company (SCG) indicated that the Approved Project would not result in significant adverse natural gas facilities in the area.

Telephone

Telephone service for the Approved Project would be provided by Verizon communications, which indicated that it had the ability to provide the TTM 31194 site with telephone service. Significant impacts associated with the provision of telephone service would not occur.

Approved Project Mitigation Measures

No mitigation measures were required for the Approved Project regarding utilities.

Proposed Project Impact Analysis

Electricity

Southern California Edison (SCE) provides electricity to the Project Site. The Proposed Project would connect to existing facilities in the public right-of-way (ROW). The Proposed project would not require new or expanded electric power facilities other than connections to the existing electricity grid.

Buildout of the Proposed Project would be estimated to require approximately 1,574,979 kilowatt hours per year (kWh/yr.). Since the anticipated kWh/yr. for the Proposed Project would be below the required kWh/yr. analyzed for the Approved Project, it is assumed that the Proposed Project would not adversely affect electrical service or demand. The Proposed Project would be required to implement all relevant energy conservation measures as outlined in Title 24 of the California Code of Regulations.

Natural Gas

Southern California Gas (SoCalGas) would provide natural gas service to the Project Site. The availability of natural gas service is based on present gas supply and regulatory policies. As a public utility, SoCalGas is under the auspices of the California Public Utilities Commission and federal regulatory agencies. Should these agencies take any action that affects gas supply or the conditions under which service is available, gas service would be provided in accordance with revised conditions. Development of the Proposed Project would comply with regulations and standards pertaining to natural gas and would connect to the existing natural gas infrastructure.

The Proposed Project would be estimated to consume approximately 64,223,940 cubic feet per year of natural gas at buildout. It is assumed that the Proposed Project would not result in significant adverse natural gas facilities in the area.

Telephone

Frontier Communications would provide telecommunication facilities to the Proposed Project, including telephone, cable television, and high-speed internet services. Therefore, the area is adequately served by telecommunications facilities. The Proposed Project would include on-site connections to off-site telecommunication services and facilities in the immediate area. Facilities and infrastructure for telecommunication are adequate to serve the needs of the Proposed Project. The Proposed Project would not result in or require the construction of new or expanded telecommunication facilities.

Proposed Project Mitigation Measures

No mitigation measures would be required for the Proposed Project regarding utilities.

4.1.25 Disaster Preparedness

Approved and Proposed Project Impact Analysis

Fire Hazards

See Section 4.1.16, *Fire Protection*, of this EIR Addendum.

Seismic Hazards

See Section 4.1.7, *Geology and Slope Stability*, of this EIR Addendum.

Slope and Soil Instability Hazards

See Section 4.1.8, *Soils, Slopes, and Erosion Potential*, of this EIR Addendum.

Flood and Inundation Hazards

See Section 4.1.5, *Hydrology, Flooding, and Drainage*, of this EIR Addendum

4.2 FINDINGS

The discussion in this Addendum evaluates the Proposed Project for significant impacts pursuant to CEQA. As a result, and for the reasons explained in this Addendum, the Proposed Project would not cause any new significant environmental impacts or substantially increase the severity of significant environmental impacts disclosed in the Certified EIR. There are no mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative, or mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative. Thus, the Proposed Project does not trigger any of the conditions in CEQA Guidelines Section 15162 requiring the preparation of a subsequent EIR, and the appropriate environmental document as authorized by CEQA Guidelines Section 15164(b) is an addendum.

The following identifies the standards in Section 15162 of the CEQA Guidelines as they relate to the Proposed Project. When an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in light of the whole record, one or more of the following:

1. **No substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects**

   As discussed previously, the Proposed Project would have similar environmental impacts to those discussed in the Certified EIR for the Approved Project. The Proposed Project would increase the number of residential units in the Project Site; however, the Proposed Project would be located within the same footprint of the Approved Project and thus would not be anticipated to result in any additional or substantially increased impacts, as shown in Section 4.1, *Environmental Analysis*. Therefore, the Proposed Project would be anticipated to make efficient use of land when compared to the physical environmental impacts that were evaluated in the Certified EIR.

   The Proposed Project would continue to comply with all applicable Federal, State, and local laws, and the Proposed Project would be consistent with the City's General Plan. Therefore, no substantial changes are proposed that will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

2. The project will have one or more significant effects not discussed in the previous EIR.

Since certification of the EIR, the City incorporated and the project approvals became the responsibility of the City. The City has been proceeding using the adopted materials, and there have been no other changes in the Project Site or the surrounding area with regard to circumstances in which the Approved Project was undertaken. As described previously, the impacts of the Proposed Project would be less than or equal to those analyzed in the Certified EIR. Significant air quality and circulation and traffic impacts would remain similar to what is identified in the Certified EIR with the implementation of the Proposed Project. Therefore, no major revisions to the Certified EIR would be required due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

3. Significant effects previously examined will be substantially more severe than shown in the previous EIR.

The Proposed Project would have the same significant impacts as disclosed in the Certified EIR. The Certified EIR identified significant impacts for air quality and circulation and traffic. Implementation of the Proposed Project would not result in new significant environmental impacts. Although the dwelling units for Phase 4 of the Proposed Project would increase, the environmental impacts under the Proposed Project would not be substantially more severe than those analyzed in the Certified EIR. Therefore, no impacts of the Proposed Project would be substantially more severe than those analyzed in the Certified EIR.

4. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative.

As shown in Section 4.1, *Environmental Analysis*, the Proposed Project would not have any new substantial impacts when compared to the Approved Project, and would not require the implementation of any mitigation measures found not to be feasible. Some of the previous mitigation measures discussed in the Certified EIR would continue to be applicable to the Proposed Project to reduce potential environmental impacts to less-than-significant, while other mitigation measures have been revised to for the Proposed Project, and would comply with regulations set forth by the City of Menifee. Therefore, the Proposed Project would not result in new significant environmental impacts; thus, there is no need for mitigation measures found by the Certified EIR not to be feasible.

5. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The Proposed Project would have environmental impacts that would not be substantially more severe than those of the Approved Project. As stated previously, no additional impacts or substantially more severe impacts would occur as a result of the Proposed Project. No new mitigation measures or alternatives which are considerably different from those analyzed in the Certified EIR would be required for the Proposed

4. CEQA Analysis

Project. Although some of the previous mitigation measures discussed in the Certified EIR would continue to be applicable to the Proposed Project to reduce potential environmental impacts to less-than-significant, other mitigation measures have been revised, and would comply with regulations set forth by the City of Menifee. Therefore, there are no new mitigation measures or alternatives required for the Proposed Project, and potential impacts would not be substantially more severe that those of the Approved Project. The MMRP adopted for the EIR in 2007 has been updated for the Proposed Project (see Appendix B).

5. References

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5. References

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5. References

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Appendix A. 2007 Certified EIR – Mitigation Monitoring and Reporting Program

Appendix A. 2007 Certified EIR - Mitigation Monitoring and Reporting Program

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
4.1 LAND USE CONSISTENCY				
The proposed project would be consistent with applicable policies from the Riverside County General Plan, the Sun City/Menifee Valley Area Plan, the MSHCP, the CETAP, SCAG, and the SCAQMD AQMP.	Not significant.	Mitigation is not required.	None	None
4.2 AESTHETICS, VISUAL QUALITY, LIGHT AND GLARE				
At build-out of the proposed project, views of the site from surrounding areas would change from predominately vacant land to medium density residential and open space land uses. This change is not regarded as adverse. The site's most prominent visual characteristic, consisting of a natural hillside occurring in the northeast portion of the project site, would be preserved as natural open space The proposed project site is located within the Mt. Palomar Observatory Special Lighting Area. Lighting from the proposed project could adversely affect the Palomar Observatory, resulting in a potentially significant impact.	Reduced to below a level of significance.	**4.2-1** The project shall comply with the applicable provisions of County Ordinance No. 655, which was established to regulate the use of certain light fixtures, and requires evidence of compliance with the lighting standards discussed in Section 4.2. All outdoor lighting systems shall comply with Ordinance No 655.	Riverside County Planning Department; Riverside County Building and Safety Department	Prior to the issuance of building permits.
4.3 BIOLOGICAL RESOURCES				
Vegetation Communities The project site is not located in the MSHCP Criteria Area. On-site grading and development would remove or disturb approximately 152.1 acres of agricultural, disturbed or ruderal habitat, 2.1 acres of northern mixed chaparral, 18.3 acres of Riversidean sage scrub (including a 100' fuel modification zone along the development's northeastern edge), 2.4 acres of disturbed Riversidean sage scrub and 0.8 acres of southern arroyo willow/mulefat scrub. Of the 2.0 acres that will be disturbed off-site, impacts would occur to 1.97 acres of agricultural, disturbed, or ruderal habitat, 0.02 acres of southern arroyo willow/mulefat scrub and 0.01 acre of Riversidean sage scrub.	Reduced to below a level of significance.	**Vegetation Communities** **4.3-1** TTM No. 31194, Lot #503 (approximately 39.0 acres in the northeastern portion of the property) shall be preserved as open space and shall be covered by a conservation easement or other mechanism to ensure permanent preservation, with allowance for required maintenance of fuel modification zones. The conservation easement area shall be shown on the Final Map.	Riverside County Planning Department	Prior to the issuance of clearing, grubbing, or grading permits.
Sensitive Plant Species No sensitive plant species were observed on-site. The site is not located in the MSHCP Criteria Area. Additionally, the proposed project site is not identified in an area required to be surveyed pursuant to the MSHCP's Protection of Narrow Endemic Plant Species guidelines and the MSHCP's Additional Survey Needs and Procedures. Therefore, focused botanical surveys are not required for the project site, and any impacts to sensitive plant species, if	Not significant.	Mitigation is not required.	Not applicable.	Not applicable.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
present, are not regarded as significant. The project applicant will be required to comply with Riverside County Ordinance No. 4.62.070 which requires payment of a MSHCP mitigation fee order to assist in providing revenue to acquire and conserve lands necessary to implement the MSHCP.				
Sensitive Wildlife Species The project site is located outside of the MSHCP Criteria Area; however, in accordance with MSHCP's Additional Survey Needs and Procedures, burrowing owl surveys are required. Although burrowing owl was not observed on the site, it does have the potential to move onto the site due to its migratory nature. Potential impacts to burrowing owl is considered significant.	Reduced to below a level of significance.	**Sensitive Wildlife Species** **4.3-2** Thirty days prior to grading, a qualified biologist shall make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report to be reviewed and accepted by the County of Riverside. If the species is determined to be present, and the MSHCP's stated objectives 1 – 4 for burrowing owl have not yet been met, mitigation shall be required in compliance with the MSHCP, Appendix E which states: a. If the site contains or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and surrounding area supports less than 3 pairs of burrowing owls, then the on-site burrowing owls shall be passively or actively relocated following accepted protocols. b. If the site (including adjacent areas) supports 3 or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs shall be conserved on-site.	Riverside County Planning Department	Prior to the issuance of clearing, grubbing or grading permits.
		4.3-3 Prior to issuance of grading permits, the applicant shall be required to pay Local Development Mitigation Fees (per County Ordinance No. 4.62.070) for implementation of the MSHCP.	Riverside County Planning Department	Prior to the issuance of clearing, grubbing or grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.3-4 Prior to issuance of grading permits, the applicant shall pay fees in accordance with the USFWS-approved HCP, to mitigate the projects potentially significant impacts to the Stephens' kangaroo rat.	Riverside County Planning Department	Prior to the issuance of clearing, grubbing or grading permits.
		4.3-5 If construction activities will occur between February 1 and August 31 and within 150 feet of suitable nesting locations, a focused raptor survey will be required prior to issuance of grading permits. If active nests are located within the portion of the site to be disturbed or within 150 feet of the area to be disturbed, measures shall be initiated to avoid any impacts to young. Measures to avoid impacts will include identifying the location and creating a buffer zone around the tree within which impacts will be avoided until the juveniles have fledged. a. The white-tailed kite is "fully-protected" by the California Department of Fish and Game. If this species is documented as nesting on the project site during the raptor survey, or it is determined this species will be significantly impacted by development a 2080 permit for "take" shall be required from the CDFG.	Riverside County Planning Department	Prior to the issuance of clearing, grubbing or grading permits.
Jurisdictional Wetlands and Waters Jurisdictional areas on the project site include 62,384.3 square feet 1.43 ac) of state streambeds, and 37,667.9 square feet 0.67 ac) of federal jurisdictional drainages. Implementation of TTM No. 31194 would result in impacts to 34,512.6 square feet (0.79 ac) of state streambeds, of which 1,316 square feet (0.03 ac) are state wetlands and 18,748.6 square feet (0.43 ac) are federal jurisdictional drainages. Impacts to these jurisdictional wetlands and waters is considered significant.	Reduced to below a level of significance.	**Jurisdictional Wetlands and Waters** **4.3-6** Prior to the issuance of grading permits, the applicant shall submit documentation to the County of Riverside verifying that the necessary permits required by the U.S. Army Corps of Engineers (ACOE), California Department of Fish and Game (CDFG) and Regional Water Quality Control Board (RWQCB) have been obtained. The ACOE has a no net loss policy which requires that any unavoidable	Riverside County Planning Department. RCA, ACOE, CDFG	Prior to the issuance of clearing, grubbing or grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		impacts to wetland values and functions be replaced. In addition, the RWQCB will add restrictions to control runoff from the site, require on the site treatment of runoff to improve water quality, and impose Best Management Practices on the construction. It is anticipated that the following measures or similar measures as approved by the ACOE, CDFG, and RWQCB would reduce impacts to ACOE and CDFG jurisdictional areas to a level less than significant: (a) On or off-site replacement of ACOE jurisdictional waters and wetlands at a ratio no less than 1:1; (b) On or off-site replacement of CDFG jurisdictional streambed and associated riparian habitat at a ratio no less than 1:1; and/or (c) Incorporation of design features into the proposed project that will avoid biological impacts to off-site blue-line streams that ultimately end up in the Railroad Canyon Reservoir (Canyon Lake).		
		4.3-7 Individual lot fencing shall be used to restrict access to the on-site wetland areas. Back yard gates from individual residential lots that open onto the wetland area shall be prohibited. Fencing locations and materials shall be shown on the Final Map and approved by the County's Environmental Programs Department (EPD) prior to issuance of building permits. Required fencing shall be installed prior to issuance of occupancy permits.	Riverside County Environmental Programs Department	Prior to Final Map approval and issuance of building and occupancy permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.3-8 Night lighting during and after project construction shall be directed away from onsite wetland areas and, except for safety and other requirements, lighting shall be limited from the boundaries of onsite wetland areas. In the event that lighting in an area adjacent to the wetland area is necessary, a shield shall be incorporated in project designs to ensure ambient lighting in the wetland area is not increased. Lighting plans shall be approved by the County prior to issuance of building permits. Lighting restrictions and the reasons for such restrictions shall be included in the project's CC&Rs.	Riverside County Planning Department	Prior to issuance of building permits.
		4.3-9 The landscape plans for the project in areas adjacent or tributary to wetland areas shall not include those species listed in the MSHCP as "Plants That Should Be Avoided Adjacent To The MSHCP Conservation Area". The County of Riverside Planning Department shall review and approve all plant material for the project, prior to issuance of building permits. Information regarding the importance of avoiding the listed plants, even in front and backyard landscaping, shall be included in sales literature distributed to homeowners. The list of restricted plant materials and the reasons for such restrictions shall be listed in the project's CC&Rs.	Riverside County Planning Department	Prior to issuance of building permits.
4.4 ARCHAEOLOGICAL AND PALEONTOLOGICAL RESOURCES				
Archaeological Resources There are no historic or prehistoric sites identified on the proposed project site. However, archaeologically sensitive sites have been identified within the project vicinity, and the potential for	Reduced to below a level of significance.	**Archaeological Resources:** **4.4-1** Prior to any clearing, grubbing and/or earth moving activities, a qualified archaeologist shall be retained by the developer. land divider for consultation and comment on the proposed grading with respect to	Riverside County Planning Department; Project Archaeologist	Prior to the issuance of grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
archaeologically sensitive sites occurring on the proposed project site exists. The potential for disturbance to undiscovered		potential impacts to sub-surface cultural resources. Should the archaeologist, after The potential for discovery of archaeological resources on the site has been indicated as medium to high; therefore,		
		4.4-2 (A) Prior to issuance of a grading permit, the archaeologist shall develop a mitigation plan and a discovery clause/treatment plan, which shall include mitigation monitoring to be implemented during earthmoving on the project site. The treatment plan shall be developed in consultation with the culturally affiliated Luiseño Tribe(s) Pechanga Tribe and shall account for treatment of any archaeological remains and associated data uncovered by brushing, grubbing, or earthmoving. (B) The project applicant shall enter into a pre-excavation agreement with the culturally affiliated Luiseño Tribe(s). The agreement shall document archeological monitoring requirements and specify the disposition of any significant resources discovered during monitoring.	Riverside County Planning Department; Project Archaeologist	Prior to the issuance of clearing, grubbing or grading permits
		4.4-3 Prior to the issuance of a grading permit and again if necessary during the development of the final project mitigation report, the project proponent shall inquire if the Pechanga Tribe has developed a standard retrievable archival system for cultural materials. If such system is in place, the Pechanga Tribe shall be given preference in housing any collection. The landowner shall relinquish ownership of all cultural resources, including all Luiseno cultural sacred items, burial goods and all archaeological artifacts that are found on the project	Riverside County Planning Department; Project Archaeologist	Concurrent with grading activities

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		site, to the culturally affiliated Luiseño Tribe(s) for proper treatment and disposition.		
		4.4-4 Archaeological and tribal monitoring shall be conducted on a full-time basis for all grading and ground disturbing activities, including archaeological testing, until the project archaeologist in consultation with the culturally affiliated Luiseño Tribe(s) Pechanga Tribe and the County of Riverside determines that resources are not likely to be encountered.	Riverside County Planning Department; Project Archaeologist	Concurrent with grading activities.
		4.4-5 If archaeological remains are found by the archaeological monitor, earthmoving shall be diverted temporarily around the deposits until they have been evaluated, recorded, excavated, and/or recovered as necessary. Earthmoving shall be allowed to proceed through the site when the archaeological supervisor, in consultation with the culturally affiliated Luiseño Tribe(s) Pechanga Tribe and the County of Riverside, determines the artifacts are recovered and/or the site is mitigated to the extent necessary.	Riverside County Planning Department; Project Archaeologist; NAHC	Concurrent with grading activities.
		4.4-6 If possible human remains are encountered during any earthmoving activities, all work shall stop in the area in which the find(s) are present, and the Riverside County Coroner must be notified. State law dictates that the Native American Heritage Commission (NAHC) shall be notified in the event that remains are determined to be human and of Native American decent, in accordance with California Public Resources Code Section 5097.98.	Riverside County Planning Department; Project Archaeologist	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.4-7 If a previously unknown site is encountered and it requires additional mitigation, a plan or proposal shall be prepared by the archaeologist, in consultation with the culturally affiliated Luiseño Tribe(s) Pechanga Tribe and County of Riverside, outlining the plan of action that needs to be implemented to mitigate the new site.	Riverside County Planning Department; Project Archaeologist	Concurrent with grading activities.
		4.4-8 Any recovered archaeological resources shall be identified, recorded, mapped and artifacts catalogued as required by standard archaeological practices. Examination by an archaeological specialist shall be included where necessary, dependent upon the artifacts, features or sites that are encountered. Specialists shall identify, date, and/or determine significance potential.	Riverside County Planning Department; Project Archaeologist	Concurrent with grading activities.
		4.4-9 A final report of findings shall be prepared by the archaeologist for submission to the Eastern Information Center and the County of Riverside. The report shall describe parcel history, summarize field and laboratory methods used, if applicable, and include any testing or special analysis information conducted to support the findings.	Riverside County Planning Department; Project Archaeologist	At the completion of grading activities.
Paleontological Resources Portions of the proposed project site contains Quaternary alluvium (Qofa), which has a high potential for yielding fossils. The potential for disturbance to paleontological resources during grading in older alluvium is regarded as a potentially significant impact.	Reduced to below a level of significance.	**Paleontological Resources** **4.4-10** Prior to any earth moving in areas containing older alluvium, a vertebrate paleontologist retained by the project proponent and approved by the County of Riverside shall develop a storage agreement with the LACM Vertebrate Paleontology Section, San Bernardino County Museum, or another acceptable museum repository to allow for the permanent storage and maintenance of any fossil remains	Riverside County Planning Department; Project Paleontologist	Prior to issuance of grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		recovered in the project area as a result of the monitoring program, and for the archiving of associated specimen data and corresponding geologic and geographic site data at the museum repository.		
		4.4-11 The paleontologist shall develop a mitigation plan and a discovery clause/treatment plan that, when implemented during earthmoving activities in the project area shall allow for the recovery and subsequent treatment of any fossil remains and associated specimen and site data uncovered by these activities.	Riverside County Planning Department; Project Paleontologist	Concurrent with grading activities.
		4.4-12 The paleontologist and a palaeontologic construction monitor shall attend a pre-grade meeting to explain the monitoring program to grading contractor staff and to develop procedures and lines of communication to be implemented if fossil remains are uncovered by earthmoving activities, particularly when a monitor may not be on-site.	Riverside County Planning Department; Project Paleontologist	Prior to issuance of grading permits.
		4.4-13 Palaeontologic monitoring of earthmoving activities shall be conducted on a full-time basis by the monitor during all earthmoving activities due to the exposure of sensitive strata. Earthmoving activities in areas of the project area where previously undisturbed strata will be buried but not otherwise disturbed shall not be monitored. The supervising paleontologist shall have the authority to reduce monitoring once he determines the probability of encountering fossils has dropped below an acceptable level.	Riverside County Planning Department; Project Paleontologist	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.4-14 If the monitor finds fossil remains, earthmoving activities shall be diverted temporarily around the fossil site until the remains have been recovered and these activities are allowed to proceed through the site by the monitor.	Riverside County Planning Department; Project Paleontologist	Concurrent with grading activities.
		4.4-15 If fossil remains are encountered by earthmoving activities when the monitor is not on site, these activities shall be diverted around the fossil site and the monitor called to the site immediately to recover the remains.	Riverside County Planning Department; Project Paleontologist	Concurrent with grading activities.
		4.4-16 If fossil remains are found, an appropriate amount of fossiliferous rock shall be recovered from the fossil site and processed to allow for the recovery of smaller fossil remains. Test samples may be recovered from other sampling sites in the rock unit.	Riverside County Planning Department; Project Paleontologist	Concurrent with grading activities.
		4.4-17 Any recovered fossil remains shall be prepared to the point of identification and identified to the lowest taxonomic level possible by knowledgeable paleontologists. The remains shall then be curated (assigned and labeled with museum repository fossil specimen numbers and corresponding fossil site numbers, as appropriate; placed in specimen trays and, if necessary, vials with completed specimen data cards) and catalogued, and associated specimen data and corresponding geologic and geographic site data shall be archived (specimen and site numbers and corresponding data entered into appropriate museum repository catalogs and computerized data bases) at the museum repository by a laboratory technician. The remains shall then be accessioned into the museum	Riverside County Planning Department; Project Paleontologist	Upon commencement of grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		repository fossil collection, where they shall be permanently stored, maintained, and, along with associated specimen and site data, made available for future study by qualified scientific investigators.		
		4.4-18 A final report of results and findings shall be prepared by the paleontologist for submission to the County of Riverside and the museum repository following accessioning of the fossil collection into the museum repository fossil collection. The report shall describe the geology and stratigraphy parcel, summarize field and laboratory methods used, include a faunal list and an inventory of catalogued fossil specimens, evaluate the scientific importance of the specimens, and discuss the relationship of any newly recorded fossil site in the parcel to relevant fossil sites previously recorded from the fossil-bearing rock unit in the parcel vicinity and from correlative rock units in other regions.	Riverside County Planning Department; Project Paleontologist	Upon completion of grading activities.
4.5 HYDROLOGY, FLOODING, AND DRAINAGE				
The proposed project would not alter the existing drainage pattern of the site or area, substantially deplete groundwater supplies or interfere substantially with groundwater recharge, or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems.	Reduced to below a level of significance.	Mitigation is not required.	None	None
4.6 WATER QUALITY				
Implementation of the proposed project would include grading that would result in potential short-term erosion and sedimentation impacts. Implementation of the proposed project also would permanently alter the composition of the surface runoff by grading the site surfaces; by construction of impervious surfaces; and by irrigation of landscaped areas. Although water quality features	Reduced to below a level of significance.	**4.6-1** The developer or builder for TTM No. 31194 shall be required, pursuant to requirements of the State Water Resources Control Board, to obtain a National Pollutant Discharge Elimination System (NPDES) construction permit, prior to issuance of grading permits. The NPDES permit will apply to all	Riverside County Flood Control and Water Conservation Department; Regional Water	Prior to the issuance of grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
would reduce direct impacts to water quality, cumulative impacts would remain significant and require mitigation.		construction activities associated with the proposed project. Construction activities include clearing, grading, or excavation that results in the disturbance of at least one acre of total land area or activity which is part of a larger common plan of development of five acres or greater. The permit requires the applicant to develop and implement a Storm Water Pollution Prevention Plan (SWPPP), that specifies Best Management Practices (BMPs) to minimize pollutants in storm water runoff, as well as non-storm water discharges. Examples of BMPs include, but are not limited to: energy dissipation structures and rip- rap at storm wear discharge points to stabilize flow and reduce velocities; mulching cleared or freshly seeded areas for erosion/sedimentation control; geotextiles and mats for erosion control during construction, storm drain inlet/outlet protection for siltation control; and slope drains for erosion control. The permit also requires a monitoring, reporting and inspection program to be developed and implemented to assure the effectiveness of the controls.	Quality Control Board	
		4.6-2 Prior to approval of a Final Map and final engineering drawings, the County shall verify that the Final Map and engineering drawings indicate the size and location of the structural source control BMPs specified by the project's Water Quality Management Plan.	Riverside County Flood Control and Water Conservation District	Prior to approval of Final Map and final engineering drawings.
		4.6-3 Prior to issuance of occupancy permits, the County shall verify that the project's CC&Rs specify the homeowners' association ownership and maintenance requirements for private storm drains	Riverside County Planning Department	Prior to issuance of occupancy permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		and catch basins as specified in the project's Water Quality Management Plan.		
		4.6-4 Prior to issuance of occupancy permits, the County shall verify that the project's CC&Rs contain the activity restrictions and the property owner environmental education awareness materials for water quality specified by the project's Water Quality Management Plan.	Riverside County Planning Department	Prior to issuance of occupancy permits.
4.7 GEOLOGY AND SLOPE STABILITY				
The portions of the site that contain alluvium and undocumented fill (if any) are considered unsuitable in their present condition for support of structural loads. The presence of alluvium and potential for presence of undocumented fill represents a potentially significant impact that will require mitigation in the form of remedial grading. Construction of proposed structures in accordance with the Uniform Building Code (UBC) will ensure that potential ground shaking impacts will not result in a significant impact. Liquefaction pestilential is low, seismically induced settlement is unlikely and the potential for tsunamis and seiches is non-existent.	Reduced to below a level of significance.	**4.7-1** Prior to the issuance of grading permits and in compliance with the requirements of Riverside County Ordinances, a detailed geotechnical report(s) shall be submitted to the County of Riverside Engineering Division for review and approval. The report(s) shall identify and address site-specific (a) underlying soil conditions, (b) liquefaction potential, seismic parameters and building requirements and slope stability. The measures recommended by the final geotechnical report(s) shall be identified on applicable grading plans and shall be implemented to the satisfaction of the County Geologist.	Riverside County Engineering Division; Riverside County Geologist; Project Geologist	Prior to the issuance of grading permits.
		4.7-2 All earthwork and grading shall be performed in accordance with all applicable requirements of the Grading and Excavation Code and the Grading Manual of the County of Riverside, in addition to the provisions of the 1997 Uniform Building Code (UBC), including Appendix Chapter 33. Grading shall also be performed in accordance with applicable provisions of the Standard Grading Specifications contained in the geotechnical report	Riverside County Engineering Division; Riverside County Geologist; Project Geologist	Concurrent with grading activities.

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		prepared by Leighton and Associates (see EIR Appendices H1. and H2.).		
		4.7-3 The project geotechnical engineer or qualified representative shall be notified at appropriate times to provide observation and testing services during clearing operations and to verify compliance with the recommendations made by the project geotechnical reports. In addition, any buried structures or unusual or adverse soil conditions encountered that are not described or anticipated in the project's geotechnical reports shall be brought to the immediate attention of the geotechnical consultant.	Riverside County Engineering Division; Riverside County Geologist; Project Geologist	Concurrent with grading activities.
		4.7-4 All existing low-density and potentially collapsible soil materials, such as loose manmade fill and alluvium, shall be removed to underlying competent bedrock from each area to receive compacted fill. Prior to placing structural fills, the exposed bottom surfaces in each removal area shall first be scarified to a depth of 6 inches or more, watered or air-dried as necessary to achieve near-optimum moisture conditions, and then recompacted in-place to a minimum relative compaction of 90 percent. Actual depths and horizontal limits of any removals shall be determined during grading on the basis of in-grading observations and testing performed by the project geotechnical consultant and/or engineering geologist.	Riverside County Engineering Division; Riverside County Geologist; Project Geologist	Concurrent with grading activities and prior to the issuance of building permits.
		4.7-5 In the event import soils are needed to achieve final design grades, all potential import materials shall be free of deleterious/oversize materials, non-	Riverside County Engineering Division; Riverside County	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		expansive, and approved by the project geotechnical consultant prior to commencement of delivery onsite.	Geologist; Project Geologist	
		4.7-6 An observation of clearing operations, removal of unsuitable surficial materials, and general grading procedures shall be performed by the project geotechnical consultant or his/her representative. Fill shall not be placed without prior approval from the geotechnical consultant. The project geotechnical consultant or his/her representative shall also be present on-site during all grading operations to verify proper placement and adequate compaction of all fill materials, as well as to verify compliance with the other recommendations presented in the project geotechnical reports.	Riverside County Engineering Division; Riverside County Geologist; Project Geologist	Concurrent with grading activities.
		4.7-7 No oversized rock (greater than 12 inches) shall be place within 10 feet of the finished grade.	Riverside County Engineering Division; Riverside County Geologist; Project Geologist	Concurrent with grading activities.
		4.7-8 Cut and fill slopes steeper than 3:1 (horizontal: vertical) and exceeding a vertical height of 30 feet shall be constructed with drainage terraces in accordance with Chapter 33 of the 1997 UBC.	Riverside County Engineering Division; Riverside County Geologist; Project Geologist	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
4.8 SOILS, SLOPES AND EROSION POTENTIAL				
The majority of the on-site materials consist of low plastic clays to fine sandy silts, and generally possess a very low to low expansion potential. While not observed during field reconnaissance, it is possible for undocumented fills or other materials with an expansion potential greater than low could be encountered during construction. If present, these materials would not be suitable for structural development, and this is regarded as a potentially significant impact. Because the topographic character of the site will be maintained and because the project will comply with the Riverside County Grading Standards, significant impacts to landform would not occur. Soils that have a high erosion susceptibility, along with fill materials used for development areas, would be subject to potentially significant project-related erosion because of the removal of stabilizing vegetation and exposure of these erodible materials to wind and water.	Reduced to below a level of significance.	**4.8-1** Prior to the issuance of a grading permit, an overall Conceptual Grading Plan shall be submitted for Planning Department approval. The Grading Plan shall include: 1) techniques employed to prevent erosion and sedimentation during and after the grading process; 2) approximate time frames for grading; 3) identification of areas which may be graded during high probability rain months (January through March); and 4) preliminary pad and roadway elevations.	Riverside County Planning Department	Prior to the issuance of grading permits.
		4.8-2 Where cut and fill slopes are created higher than three feet, detailed Landscaping and Irrigation Plans shall be submitted to the Planning Department prior to Grading Plan approval. The plans shall be reviewed for type and density of ground cover, shrubs, and trees to ensure that plant material would be effective as erosion control and that all slopes would be landscaped per County Ordinance 457.	Riverside County Planning Department	Prior to issuance of grading permits.
		4.8-3 All grading procedures shall be in compliance with the Riverside County Grading Standards including requirements for erosion control during rainy months. The requirements for compliance with Riverside County Grading Standards shall be noted on all grading plans.	Riverside County Planning Department; Riverside County Engineering Division.	Prior to issuance of grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.**8-4** Graded, but undeveloped land shall be maintained weed-free and planted with interim landscaping within 90 days of completion of grading, unless building permits are obtained.	Riverside County Planning Department	Upon completion of grading activities.
		4.8-5 Prior to any grading activities, a soils report and geotechnical study shall be performed to further analyze on-site soil conditions and slope stability and shall include the appropriate measures to control erosion.	Riverside County Planning Department	Prior to issuance of grading permits.
		4.8-6 Potential brow ditches, terrace drains, or other minor swales, determined necessary by the County of Riverside at future stages of project review, shall be lined with natural erosion control materials or concrete.	Riverside County Planning Department	Prior to the issuance of grading permits.
		4.8-7 The locations of potentially compressible soils shall be identified on all Grading Plans. Where development is proposed in areas of compressible soils, deep foundation systems shall be used, or compressible soils shall be completely over excavated and compacted.	Riverside County Planning Department	Prior to the issuance of grading permits.
4.9 AGRICULTURE				
Approximately 164.7 acres of the proposed project site are designated as Local Important Farmland. Upon project implementation, farming on these soils would be precluded. Williamson Act Contracts existed on the property, but Notices of Non-Renewal were recorded over 10 years ago, and dimishment of Menifee Agricultural Preserve No. 4, Map No. 902 was adopted by Resolution No. 2003-534 on December 1, 2003. The proposed project is located within 300 feet of agriculturally zoned properties and is required to comply with County Ordinance No. 625.	Reduced to below a level of significance.	**4.9-1** The project shall comply with the County's "Right to Farm" Ordinance (Ordinance No. 625). The ordinance is intended to provide for a means of giving notice to prospective buyers of homes in newly built subdivisions and recently subdivided parcels that they are moving into an agricultural area and that a farm has been in operation legally for at least three years shall not be or become a nuisance simply because residential uses have	Riverside County Planning Department	Prior to issuance of occupancy permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		entered the area and are offended by the odors, dust, etc.		
4.10 MINERAL RESOURCES				
The project would not result in the loss of an Aggregate Resource Area. The property is not located near a State classified or designated area or existing surface mine.	Not significant.	Mitigation is not required.	None	None
4.11 TOXIC SUBSTANCES				
During grading and construction, there is a low potential for discovery of hazardous materials; this possibility is regarded as a potentially significant impact.	Reduced to below a level of significance.	**4.11-1** Users of household hazardous materials such as paints, roofing materials and solvents during construction shall comply with applicable federal, state, and local regulation requiring elimination and reduction of waste at the source by prevention of leakage, by segregation of hazardous waste, and by process of materials change.	Riverside County Department of Environmental Health	Prior to the issuance of building permits.
		4.11-2 All site improvements not removed from the property by the current owner shall be disposed of offsite, in accordance with current local, state, and federal disposal regulations. Any petroleum contaminated materials, lead-based paints or products, mercury, asbestos containing materials and/or buried trash/debris encountered during removal and/or grading shall be evaluated by an experienced environmental consultant prior to removal.	Riverside County Department of Environmental Health	Prior to the issuance of grading permits.
		4.11-3 In the event that any subsurface hazardous materials, including soil and/or groundwater contamination, are found during grading or construction, all activity in the area of discovery and/or in an appropriate radius of the area of discovery shall temporarily cease and the County of Riverside Environmental Health Department shall be notified prior to the resumption of any	Riverside County Department of Environmental Health	Concurrent with grading and construction activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		construction activity in the area of discovery, the site shall be deemed safe by the appropriate entity prior to the resumption of grading and/or constructions activities.		
		4.11-4 If soil is to be imported or exported to or from the site during grading or other construction activities, the transported soil it shall be sampled for contaminants assessed prior to proposed off-site use or disposal. Imported soil shall be free from contamination. Exported soil, if contaminated, shall be and handled in accordance with prevailing environmental laws and regulations, including Land Use Disposal Restrictions, if applicable.	Riverside County Department of Environmental Health	Concurrent with grading and construction activities.
		4.11-5 Prior to the issuance of grading permits, soil sampling shall occur to identify levels of methane, pesticides, herbicides, fertilizer, and other agricultural chemicals. Methane and chemical levels shall be verified to be within allowable limits as regulated by prevailing environmental laws and regulations prior to the issuance of building permits.	Riverside County Department of Environmental Health	Prior to the issuance of grading and building permits.
4.12 CIRCULATION AND TRAFFIC				
A total of 4,632 average daily trips would be generated by the project. Vehicle trips would impact study area intersections and street segments in the Opening Year and Buildout Year 2025.	Less than significant direct impacts. Cumulatively significant impacts to freeway mainline segments.	**4.12-1** Wickerd Road shall be constructed from the easterly project boundary to the westerly project boundary to align with Garbani Road at its ultimate full-section width as a Major roadway.	Riverside County Transportation Department	Prior to issuance of building and occupancy permits

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
	Cumulatively significant impacts to intersections identified in EIR Tables 4-11 and 4-12 in the event that the approval of other jurisdictions (Caltrans and Murrieta) for identified intersection improvements cannot be obtained.			
		4.12-2 Garbani Road shall be constructed as a paved two-lane extension from Evans Road to the westerly project to provide site access with a minimum of a 32 foot pavement section.	Riverside County Transportation Department	Prior to issuance of building and occupancy permits
		4.12-3 Wickerd Road shall be constructed as a paved two-lane extension from the easterly project boundary to Haun Road to provide site access with a minimum of a 32 -foot pavement section.	Riverside County Transportation Department	Prior to issuance of building and occupancy permits
		4.12-4 Internal roadways shall be constructed as Collector Roadways in accordance with County Transportation Department standards.	Riverside County Transportation Department	Prior to issuance of building and occupancy permits
		4.12-5 On-site traffic signing and striping shall be implemented in conjunction with detailed construction plans for the project site.	Riverside County Transportation Department	Concurrent with project implementation.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.12-6 Sight distance at each project access roadway shall be reviewed with respect to standard City of Perris, Caltrans, and County of Riverside sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.	Riverside County Transportation Department	Concurrent with project implementation.
		4.12-7 The project applicant shall participate in the phased construction of off-site traffic signals through the County's traffic signal fee program.	Riverside County Transportation Department	Concurrent with project implementation.
4.13 AIR QUALITY				
Temporary construction activity air emissions will occur during project buildout, including dust, equipment exhaust and architectural surface treatments fumes.	Reduced to below a level of significance: PM-10 construction dust) Direct and cumulatively significant and unmitigable: NOx (construction equip. exhaust) VOC (arch. surface coatings)	**4.13-1** Prior to the issuance of grading permits, the owner/permittee shall submit an accelerated construction dust abatement management program to the County of Riverside. This involves developing a dust control program to supplement the routine watering that constitutes best available control measures (BACMs) in excess of any minimum SCAQMD Rule 403 requirements. BACMs that may be adopted and integrated into an enhanced dust control program might include hydroseeding previously disturbed areas while awaiting construction, adding chemical binders or surfactants to increase the effectiveness of watering, and/or early paving or chip sealing of roads. Soil disturbance should be terminated when high winds (>25 mph) make dust control extremely difficult.	Riverside County Building and Safety Department; South Coast Air Quality Management District	Prior to the issuance of grading permits.
		4.13-2 The project applicant/contractor shall reduce "spill-over" effects by preventing soil erosion, washing dirt from vehicles entering public roadways, and	Riverside County Building and Safety Department	Concurrent with grading and construction activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		washing/sweeping project access to public roadways on a regular schedule.		
		4.13-3 All trucks hauling dirt, sand, soil, or other loose materials are to be covered or shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114.	Riverside County Building and Safety Department	Concurrent with grading and construction activities.
		4.13-4 (A) Prior to construction commencement for each phase of the proposed development, emissions control from on-site equipment through a routine mandatory program of low-emissions tune-ups shall be required. Electric or natural gas powered construction equipment shall be used as feasible as determined by the construction superintendent. During construction, electricity should be used from power poles instead of from portable generators as feasible as determined by the construction superintendent.	Riverside County Building and Safety Department	Prior to commencement of grading and construction activity phases.
		4.13-5 The application of architectural surface treatments (i.e., paint, etc.) shall be limited to 100 gallons per day over the project buildout lifetime using the most currently required low-VOC paint (100 grams or less of ROG per liter) and high pressure-low volume (HPLV) paint applicators.	Riverside County Building and Safety Department	Concurrent with construction activities.
In the long-term, the proposed project will contribute to the regional inability to attain the SCAQMD emissions standards due to its contribution of mobile source emissions.	Cumulatively significant and unmitigable: CO (mobile source	Feasible mitigation for long-term CO emissions is not available on a project-specific basis.	N/A	N/A

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
	emissions)			
4.14 NOISE				
Construction activities, especially heavy equipment, will create short-term noise increases near the project site. The long-term noise impacts will be from traffic noise. Project-generated traffic will cause an incremental increase in area-wide noise levels throughout the Menifee Valley area.	Reduced to below a level of significance.	**4.14-1** Construction activities shall comply with County Noise Ordinance No. 457, relating to construction noise.	Riverside County Building and Safety Department	Concurrent with grading and building permits.
		4.14-2 Construction shall be restricted to the hours of 7 AM - 5 PM weekdays and Saturdays.	Riverside County Building and Safety Department	Concurrent with grading and building permits.
		4.14-3 If blasting, drilling or rock crushing occur within 800 feet of any occupied residence, temporary noise barriers (berms, walls, etc.) shall be erected to mitigate noise from these activities to an exterior noise level of 65 dB(A) or less at the nearest residential lot line.	Riverside County Building and Safety Department	Concurrent with grading and building permits.
		4.14-4 Prior to any blasting operations, all residences within 800 feet of any potential blast location shall be notified in writing of the blasting schedule, and again within a minimum of 72 hours in advance of blasting.	Riverside County Building and Safety Department	Concurrent with grading and building permits.
		4.14-5 All construction vehicles or equipment, whether fixed or mobile, shall be equipped with properly operating and maintained mufflers.	Riverside County Building and Safety Department	Concurrent with grading and building permits.
		4.14-6 Stockpiling and/or vehicle staging areas shall be located as far as practical from occupied residences.	Riverside County Building and Safety Department	Concurrent with grading and building permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.14-7 Prior to the issuance of occupancy permits for affected lots, solid barriers (walls, berms or a combination thereof) shall be provided in the following locations: a. 7.5-foot high masonry block walls or combination berm and block wall shall be constructed along Lots 218 to 220 and 229 to 239 on Wickerd Road. 7-foot high masonry block walls or combination berm and block wall shall be constructed along Lots 1 to 6, 51 to 69, 71, 72, 83 to 85, 162 to 168, 292, 293, 304, 305, 313, 314, and 320 to 326 on Wickerd Road. 6-foot high masonry block wall/privacy wall or combination berm and block wall shall be constructed along Lots 391 to 403 on Evans Road. Corner Wrap Around and Open Space Lots masonry block walls or combination berm and block wall shall be constructed along those lots along Wickerd Road that have been identified in the County's review of the acoustical analysis (see EIR Appendix G1). The height shall be determined by the adjacent wall height. These walls shall be erected so that the top of each wall extends at least 6 to 7.5 feet (depending on location) above the pad elevation of the shielded lot. In cases where the road is elevated above the pad, the wall shall extend at least 6 to 7.5 feet (depending on location) above the highest point between the homes and the road. Final noise barrier heights should be determined when final grading plans show lot location, precise road, and pad elevations.	Riverside County Building and Safety Department	Concurrent with grading and building permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.14-8 Mechanical ventilation (e.g. air conditioning) shall be provided for all homes located adjacent to Wickerd Road and Evans Road.	Riverside County Building and Safety Department	Concurrent with grading and building permits.
		4.14-9 Upgraded windows with a Sound Transmission Class (STC) rating 30 or higher shall be installed in all homes located adjacent to Wickerd Road.	Riverside County Building and Safety Department	Concurrent with grading and building permits.
		4.14-10 To minimize the potential interior noise impacts, homes facing Wickerd Road and Evans Road should be provided with weather-stripped solid core exterior doors and exterior wall/roof assembles free of cut-outs and openings	Riverside County Building and Safety Department	Concurrent with grading and building permits.
		4.14-11 Prior to issuance of building occupancy permits, the applicant shall provide the County of Riverside Department of Public Health with an interior acoustical report for review and approval. The report must demonstrate that the interior noise of those homes along Wickerd Road and Evans Road has been reduced to at or below 45 Ldn.	Riverside County Building and Safety Department	Prior to issuance of occupancy permits. Concurrent with construction activities.
4.15 OPEN SPACE, PARKS, AND RECREATION				
The project would provide a neighborhood park on ~~6.8~~ 6.4 acres and would provide ~~59.8~~ 54.3 acres of open space and landscaped areas. According to the State Quimby Act, 7.3 acres of parkland are required. The project would provide ~~0.51~~ 0.9 acres less parkland than required, resulting in a significant impact.	Reduced to below a level of significance.	**4.15-1** The project applicant shall be required to pay an in-lieu park fee to the County for its 0.51 0.9-acre park deficiency prior to the issuance of building permits.	Riverside County Parks and Open Space District.	Prior to the issuance of building permits.
4.16 FIRE PROTECTION				
Implementation of the proposed project would place additional demand on the County Fire Department and would cumulatively impact the Department's ability to service the planned population.	Reduced to below a level of significance.	**4.16-1** In accordance with Riverside County Subdivision Ordinance 460, fire flows shall have 1000 gallons per minute at 20 psi residual pressure.	Riverside County Fire Department	Prior to the issuance of building permits or water improvement plans.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.16-2 All water mains and fire hydrants shall be constructed in accordance with Ordinance 460. Hydrant spacing at each intersection shall be no more than 330 feet apart.	Riverside County Fire Department	Prior to the issuance of building permits or water improvement plans.
		4.16-3 Disclosures of potentially damaging wildfires in the area must be disclosed to future homebuyers by the seller as part of the buyer disclosure statements prior to purchase as required by the California Civil Code.	Riverside County Fire Department	Prior to the issuance of occupancy permits.
		4.16-4 Prior to issuance of the grading permits, a fire protection/vegetation management plan shall be prepared and submitted to the Fire Department for review and approval.	Riverside County Fire Department	Prior to the issuance of grading permits.
		4.16-5 Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the County Development Impact Fee (DIF) Ordinance (Ord. No. 659), which requires a fee payment that the County applies to the funding of public facilities, including fire protection facilities.	Riverside County Fire Department	Prior to the issuance of occupancy permits.
4.17 SHERIFF SERVICES				
Implementation of the proposed project would cumulatively impact the ability of the Sheriff's Department to provide service to the project area.	Reduced to below a level of significance.	**4.17-1** Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the County Development Impact Fee (DIF) Ordinance (Ord. No. 659), which requires a fee payment that the County applies to the funding of public facilities, including sheriff protection facilities.	Riverside County Planning Department	Prior to the issuance of building permits.
		4.17-2 The project applicant shall inform the Crime Prevention Unit of the Sheriff's Department of all new homeowners associations. These associations	Riverside County Sheriff's Department	Prior to the issuance of occupancy permits.

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		may be used as the foundation for establishing Neighborhood Watch Programs.		
4.18 SOLID WASTE				
Implementation of the proposed project would result in the generation of approximately599.83tons/yr. of solid waste, thereby cumulatively impacting the capacity of existing landfills.	Reduced to below a level of significance.	**4.18-1** The refuse hauler for the project site shall be advised of the efforts the developer will be pursuing relating to recycling and waste reduction (i.e., curbside recycling, in accordance with County Resolution No. 90-688. The use of such programs would be encouraged by the developer through information (e.g., location, materials accepted, etc.) provided in sales literature.	Riverside County Waste Management Department	Prior to the issuance of occupancy permits.
		4.18-2 The project applicant shall participate in established County-wide programs to reduce solid waste generation.	Riverside County Waste Management Department	Prior to the issuance of occupancy permits.
		4.18-3 The master Homeowners' Association and/or landscape maintenance district or association shall either mulch (shred and leave on landscaped areas), compost on-site, or separate from other types of waste to send to a composting facility within the local area, green waste (i.e., trimmings from grass, shrubs, or trees) from common project landscaped areas and the community park.	Riverside County Waste Management Department	Prior to the issuance of occupancy permits.
		4.18-4 The project developer shall pursue and implement any available and feasible source reduction programs for the disposal of construction materials to the satisfaction of the Riverside County Waste Management Department.	Riverside County Waste Management Department	Prior to the issuance of occupancy permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		4.18-5 The project applicant shall comply with the State Model Ordinance, which requires adequate areas for the collection and loading of recyclable materials to be provided within detached, single family residential areas where solid waste is collected and loaded in a location which serves five or more units.	Riverside County Waste Management Department	Prior to the issuance of building permits.
4.19 WATER AND WASTEWATER SERVICES				
Project implementation would result in a peak demand for 274,000 gallons of water per day. The project would provide the necessary water and wastewater facilities to serve the project. The project is required to be in compliance with the basin plan of the Regional Water Quality Control Board, Santa Ana Region. In addition, the project is required to obtain updated will-serve letters from the EMWD before subdivision or use permit implementation. The project will also be conditioned to construct an on- site recycled water system and associated off-site recycled water facilities, which will provide a non-potable water source to the site for irrigating common landscaped areas, such as green-belts and open space areas.	Not significant.	Mitigation is not required.	None	None
4.20 SCHOOLS				
Implementation of the proposed project would generate approximately 189 elementary students, 103 middle school students and 123 high school students.	Reduced to below a level of significance.	**4.20-1** Prior to the issuance of each residential building permit(s), school fees shall be paid in accordance with the requirements of the State of California (Senate Bill 50) or the applicant shall enter into a mitigation agreement with the Menifee Unified School District and the Perris Union High School District.	Menifee Union School District; Perris Union High School District	Prior to the issuance of building permits.
4.21 LIBRARIES				
Development of the proposed project would increase the region's population, creating in turn an additional demand for library facilities and services.	Reduced to below a level of significance.	**4.21-1** Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the County Development Impact Fee (DIF) Ordinance (Ord. No. 659), which requires a fee payment that	Riverside County Planning Department	Prior to the issuance of building permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		the County applies to the funding of public facilities, including library facilities.		
4.22 HEALTH CARE SERVICES				
The proposed project would result in a population increase and create a greater demand for health services in the region. Health care service is a regional issue which generally responds to current demand.	Reduced to below a level of significance.	**4.22-1** Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the County Development Impact Fee (DIF) Ordinance (Ord. No. 659), which requires a fee payment that the County applies to the funding of public facilities, including public health facilities.	Riverside County Planning Department	Prior to the issuance of building permits.
4.23 ENERGY RESOURCES				
Implementation of the proposed project would result in an increased demand for energy resources. Energy suppliers have indicated an ability to serve the proposed project based on existing and planned capacities.	Not significant.	Mitigation is not required.	None	None
4.24 UTILITIES				
Implementation of the proposed project would result in an increased demand for utilities. Utility service providers have indicated an ability to serve the proposed project based on existing infrastructure.	Not significant.	Mitigation is not required.	None	None
4.25 DISASTER PREPAREDNESS				
Fire Hazards	Reduced to below a level of significance.	See *Fire Protection,* above.		
Seismic Hazards		See *Soils and Erosion* and *Geology and Slope Stability*, above		
Soils and Erosion		See *Soil and Erosion*, above.		
Flooding		See *Hydrology, Flooding and Drainage,* above.		

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Appendix B. 2022 EIR Addendum – Mitigation Monitoring and Reporting Program

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IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
4.1.1 LAND USE CONSISTENCY	Not significant.	Mitigation is not required.	None	None
4.1.2 AESTHETICS, VISUAL QUALITY, LIGHT AND GLARE	Reduced to below a level of significance.	**4.2-1** The project shall comply with the applicable provisions of City of Menifee's Municipal Code Chapter 6.01, Dark Sky Ordinance. The Dark Sy Ordinance is the same as County Ordinance No. 655, which was established to regulate the use of certain light fixtures, and requires evidence of compliance with the lighting standards contained therein. All outdoor lighting systems shall comply with the Dark Sky Ordinance.	City of Menifee Planning Department	Prior to the issuance of building permits.
4.1.3 BIOLOGICAL RESOURCES	Reduced to below a level of significance.	**Vegetation Communities** **4.3-1** TTM No. 31194-4 Lot E, (formerly Lot #503 of TTM 31194) (approximately 39.0 acres in the northeastern portion of the property) shall be preserved as open space and shall be covered by a conservation easement or other mechanism to ensure permanent preservation, with allowance for required maintenance of fuel modification zones. The conservation easement area shall be shown on the Final Map.	City of Menifee Planning Department	Prior to the issuance of clearing, grubbing, or grading permits.
	Reduced to below a level of significance.	**Sensitive Wildlife Species** **4.3-2** Thirty days prior to grading, a qualified biologist shall make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report to be reviewed and accepted by the City of Menifee. If the species is determined to be present, and the MSHCP's stated objectives 1 – 4 for burrowing owl have not yet been met, mitigation shall be required in compliance with the MSHCP, Appendix C which states: a. If the site contains or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and surrounding area supports less than 3 pairs of burrowing owls, then the on-site burrowing owls shall be passively or actively relocated following accepted protocols. b. If the site (including adjacent areas) supports 3 or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs shall be conserved on-site.	City of Menifee Planning Department	Prior to the issuance of clearing, grubbing or grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
	Reduced to below a level of significance	**4.3-3** If construction activities occur between February 1 and August 31 and within 150 feet of suitable nesting locations, a focused raptor survey will be required prior to issuance of grading permits. If active nests are located within the portion of the site to be disturbed or within 150 feet of the area to be disturbed, measures shall be initiated to avoid any impacts to nesting raptors. Measures to avoid impacts will include identifying the location and creating a buffer zone around the tree within which impacts will be avoided until the juveniles have fledged. a. The white-tailed kite is "fully-protected" by the California Department of Fish and Wildlife. If this species is documented as nesting on the Project Site during the raptor survey, or it is determined this species will be significantly impacted by development a 2080 permit for "take" shall be required from the CDFW.	City of Menifee Planning Department	Prior to the issuance of clearing, grubbing or grading permits.
	Reduced to below a level of significance	**4.3-4** Prior to issuance of grading permits, the applicant shall pay fees in accordance with the USFWS-approved HCP, to mitigate the projects potentially significant impacts to the Stephens' kangaroo rat.	City of Menifee Planning Department	Prior to the issuance of clearing, grubbing or grading permits.
	Reduced to below a level of significance.	**Jurisdictional Wetlands and Waters** **4.3-5** Prior to the issuance of grading permits, the applicant shall submit documentation to the City of Menifee verifying that the necessary permits required by the U.S. Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW) and Regional Water Quality Control Board (RWQCB) have been obtained. The USACE has a no net loss policy which requires that any unavoidable impacts to wetland values and functions be replaced. In addition, the RWQCB will add restrictions to control runoff from the site, require on the site treatment of runoff to improve water quality, and impose Best Management Practices on the construction. It is anticipated that the following measures or similar measures as approved by the USACE, CDFW, and RWQCB would reduce impacts to USACE and CDFW jurisdictional areas to a level less than significant: a. On or off-site replacement of USACE jurisdictional waters and wetlands at a ratio no less than 1:1;	City of Menifee Planning Department	Prior to the issuance of clearing, grubbing or grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		b. On- or off-site replacement of CDFW jurisdictional streambed and associated riparian habitat at a ratio no less than 1:1; and/or c. Incorporation of design features into the proposed project that will avoid biological impacts to off-site blue-line streams that ultimately end up in the Railroad Canyon Reservoir (Canyon Lake).		
		4.3-6 Individual lot fencing shall be used to restrict access to the on-site wetland areas. Back yard gates from individual residential lots that open onto the wetland area shall be prohibited. Fencing locations and materials shall be shown on the Final Map and approved by the County's Environmental Programs Department (EPD) prior to issuance of building permits. Required fencing shall be installed prior to issuance of occupancy permits.	City of Menifee Planning Department	Prior to the issuance of clearing, grubbing or grading permits.
		4.3-7 Night lighting during and after project construction shall be directed away from onsite wetland areas and, except for safety and other requirements, lighting shall be limited from the boundaries of onsite wetland areas. In the event that lighting in an area adjacent to the wetland area is necessary, a shield shall be incorporated in project designs to ensure ambient lighting in the wetland area is not increased. Lighting plans shall be approved by the County prior to issuance of building permits. Lighting restrictions and the reasons for such restrictions shall be included in the project's CC&Rs.	City of Menifee Planning Department	Prior to the issuance of clearing, grubbing or grading permits.
		4.3-8 The landscape plans for the project in areas adjacent or tributary to wetland areas shall not include those species listed in the MSHCP as "Plants That Should Be Avoided Adjacent To The MSHCP Conservation Area". The County of Riverside Planning Department shall review and approve all plant material for the project, prior to issuance of building permits. Information regarding the importance of avoiding the listed plants, even in front and backyard landscaping, shall be included in sales literature distributed to homeowners. The list of restricted plant materials and the reasons for such restrictions shall be listed in the project's CC&Rs.	City of Menifee Planning Department	Prior to the issuance of clearing, grubbing or grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
4.1.4 ARCHAEOLOGICAL AND PALEONTOLOGICAL RESOURCES	Reduced to below a level of significance.	**Archaeological Resources:** **4.4-1** Prior to any clearing, grubbing and/or earthmoving activities, a qualified archaeologist shall be retained by the developer. The potential for discovery of archaeological resources on the site has been indicated as medium to high; therefore, consultation with the culturally affiliated Luiseño Tribe(s) is required. A pre-grading meeting between the archaeologist, a Native American observer, and the excavation and grading contractor shall take place to ensure an understanding of the mitigation measures required during construction.	City of Menifee Planning Department; Project Archaeologist	Prior to the issuance of grading permits.
	Reduced to below a level of significance	**4.4-2** (A) Prior to issuance of a grading permit, the archaeologist shall develop a mitigation plan and a discovery clause/treatment plan, which shall include mitigation monitoring to be implemented during earthmoving on the Project Site. The treatment plan shall be developed in consultation with the culturally affiliated Luiseño Tribe(s) and shall account for treatment of any archaeological remains and associated data uncovered by brushing, grubbing, or earthmoving. The mitigation and discovery/treatment plan should include a discussion of key personnel and their specific roles and responsibilities; archaeological monitoring methods; controlled excavation and/or destruction methods; environmentally sensitive areas procedures; preconstruction field surveys to identify known and unknown cultural resources; a discussion of archaeological resource classes that may be encountered during construction; and protocols for identifying, evaluating, treating, and curating archaeological resources that may be encountered. The plan should also include the following attachments: an Environmentally Sensitive Area Action Plan to preserve known bedrock milling features in place; cultural resource sensitivity training for construction personnel (i.e., Worker Environmental Awareness Program); methods for documenting bedrock milling features through close range photogrammetric documentation and viewshed analysis (i.e., direct line of sight and 180-degree viewsheds); and methods of relocating bedrock milling features to the nearest dedicated open space where they will be preserved in perpetuity. The plan will be prepared in consultation with culturally affiliated Luiseño Tribe(s). (B) The project applicant shall enter into a pre-excavation agreement with the culturally affiliated Luiseño Tribe(s). The agreement shall document archaeological	City of Menifee Planning Department; Project Archaeologist	Prior to the issuance of clearing, grubbing or grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		monitoring requirements and specific the disposition of any significant resources discovered during monitoring.		
	Reduced to below a level of significance	**4.4-3** The landowner shall relinquish ownership of all cultural resources, including all Luiseño cultural sacred items, burial goods, and all archaeological artifacts that are found on the Project Site, to the culturally affiliated Luiseño Tribe(s) for proper treatment and disposition. The Project proponent will hire a qualified archaeologist that meets Secretary of Interior Standards to oversee the surface collection of isolated prehistoric artifact RLCC-01-ISO. The field work shall be completed by an archaeologist and Native American monitor(s) on behalf of the culturally affiliated Luiseño Tribe(s).	City of Menifee Planning Department; Project Archaeologist	Concurrent with grading activities.
	Reduced to below a level of significance	**4.4-4** Archaeological and tribal monitoring shall be conducted on a full-time basis for all grading and ground-disturbing activities, including archaeological testing, until the project archaeologist in consultation with the culturally affiliated Luiseño Tribe(s) and the City determines that resources are not likely to be encountered.	City of Menifee Planning Department; Project Archaeologist	Concurrent with grading activities.
	Reduced to below a level of significance	**4.4-5** If archaeological remains are found by the archaeological monitor, earthmoving shall be diverted temporarily around the deposits until they have been evaluated, recorded, excavated, and/or recovered as necessary. Earthmoving shall be allowed to proceed through the site when the archaeological supervisor, in consultation with the culturally affiliated Luiseño Tribe(s) and the City of Menifee, determines the artifacts are recovered and/or the site is mitigated to the extent necessary.	City of Menifee Planning Department; Project Archaeologist; NAHC	Concurrent with grading activities.
	Reduced to below a level of significance	**4.4-6** If possible human remains are encountered during any earthmoving activities, all work shall stop in the area in which the find(s) are present, and the Riverside County Coroner must be notified. State law dictates that the Native American Heritage Commission (NAHC) shall be notified in the event that remains are determined to be human and of Native American descent, in accordance with California Public Resources Code Section 5097.98.	City of Menifee Planning Department; Project Archaeologist	Concurrent with grading activities.
	Reduced to below a level of significance	**4.4-7** If a previously unknown site is encountered and it requires additional mitigation, a plan or proposal shall be prepared by the archaeologist, in consultation with the	City of Menifee Planning Department; Project Archaeologist	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		culturally affiliated Luiseño Tribe(s) and City of Menifee, outlining the plan of action that needs to be implemented to mitigate the new site.		
	Reduced to below a level of significance	**4.4-8** Any recovered archaeological resources shall be identified, recorded, mapped, and artifact catalogued as required by standard archaeological practices. Examination by an archaeological specialist shall be included where necessary, dependent upon the artifacts, features or sites that are encountered. Specialists shall identify, date, and/or determine significance potential.	City of Menifee Planning Department; Project Archaeologist	Concurrent with grading activities.
	Reduced to below a level of significance	**4.4-9** A final report of findings shall be prepared by the archaeologist for submission to the Eastern Information Center and the City of Menifee. The report shall describe parcel history, summarize field and laboratory methods used, if applicable, and include any testing or special analysis information conducted to support the findings. The draft archaeological monitoring report will, at a minimum, present the results of monitoring field work, including enforcement of Environmentally Sensitive Areas; the Worker Environmental Awareness Program; efforts to relocate bedrock milling features; copies of daily monitoring logs; and appended photogrammetric documentation and viewshed analysis of bedrock milling features. If archaeological resources are discovered while implementing the monitoring program, the final monitoring report may also report on the results of lab analysis and special studies, and document the final treatment and disposition of the artifacts. The archaeological monitoring report will be completed in consultation with the culturally affiliated Luiseño Tribe(s). The Project proponent is responsible for completing a final monitoring report that addresses comments from the lead agency, Project proponent, and/or consulting tribes. Final reports must be submitted to the lead agency, Project proponent, consulting tribes, and the Eastern Information Center at the University of California, Riverside.	City of Menifee Planning Department; Project Archaeologist	At the completion of grading activities.
	Reduced to below a level of significance.	**<u>Paleontological Resources</u>** **4.4-10 Review Geotechnical Report Data.** In conjunction with the final design phase of each program-related improvement, a qualified vertebrate paleontologist will review the geotechnical report data, with particular regard to location and depth of	City of Menifee Planning Department; Project Paleontologist	Prior to issuance of grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		earthmoving and the rock unit(s) being encountered. The review is for the purpose of assessing potential for fossil remains being encountered by earth moving. If previously undisturbed strata with potential for containing fossil remains will be encountered by earthmoving, measures 4.4-11 through 4.4-18 will be implemented.		
	Reduced to below a level of significance	**4.4-11 Museum Storage Agreement.** The Western Science Center (WSC) will be the designated museum repository for any vertebrate, invertebrate, and plant fossil remains and associated specimen data and corresponding geologic and geographic site data that might be recovered from the site as a result of the Paleontological Resource Impact Mitigation Plan (PRIMP). Prior to any earthmoving on-site, the paleontologist will develop a formal agreement with the museum regarding final disposition and permanent storage and maintenance of the fossil collection and associated data. The agreement will cover, but not necessarily be limited to, museum requirements regarding: 1) level of treatment of the collection; 2) storage and maintenance fees, if any; 3) purchase of specimen storage cabinets and drawers, as well as specimen trays, vials, specimen data cards, and other curatorial supplies, if required.	City of Menifee Planning Department; Project Paleontologist	Concurrent with grading activities.
	Reduced to below a level of significance	**4.4-12 Discovery Clause/Treatment Plan:** As part of the PRIMP, the paleontologist will develop a discovery clause/treatment plan (DC/TP) to allow for additional tasks—recovery; geologic mapping; fossiliferous rock sample processing; specimen preparation, identification, curation, cataloguing, data entry; specimen storage and maintenance by museum—and manpower required to treat a large or productive fossil occurrence that cannot be treated without diverting the monitor from routine monitoring. The DC/TP will also include approved procedures and lines of communication to be followed by specific individuals if fossil remains are uncovered by earthmoving, particularly when a palaeontologic monitor is not present on-site. Names and telephone numbers of contact personnel will be included in the lines of communication. The preparation of this PRIMP ensures compliance with Mitigation Measure 4.4-12.	City of Menifee Planning Department; Project Paleontologist	Prior to issuance of grading permits.
	Reduced to below a level of significance	**4.4-13 Preconstruction Meeting:** The paleontologist or field supervisor, as well as a palaeontologic construction monitor, will attend a preconstruction meeting to explain the PRIMP to construction contractor and Richland Communities staff. The presentation will summarize mitigation procedures to be employed by PRIMP	City of Menifee Planning Department; Project Paleontologist	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		personnel and will detail procedures and lines of communication, as specified in the City of Menifee Conditions of Approval, to be followed by specific project personnel when fossil remains are found on-site. The paleontologist or field supervisor will inform the construction contractor of the following items: 1) Routine mitigation measures (primarily monitoring and test screening) to be employed by a monitor during earthmoving. 2) The potential for fossil remains being uncovered by earthmoving in particular areas of the site and the need to implement specific actions and additional mitigation measures when a fossil occurrence is uncovered by earthmoving. 3) Functions and responsibilities of the monitor when fossil remains are uncovered by earthmoving and can be recovered without diverting the monitor from monitoring—temporarily divert earth moving around fossil site until remains are evaluated and recovered, and earthmoving is allowed to proceed through the site by monitor; if approved by the construction contractor, enlist the assistance of earth-moving equipment and operator to expedite recovery of remains, obviate need for additional personnel, and reduce any potential construction delay. 4) Functions and responsibilities of the monitor when a fossil occurrence is uncovered by earthmoving and is sufficiently large or productive that it cannot be recovered without diverting the monitor from monitoring. a. Flag the site. b. Advise construction contractor to avoid fossil site until further notice (usually less than 2 days). c. Call the project paleontologist or field supervisor to site. 5) Functions and responsibilities of the paleontologist or field supervisor when notified by the monitor that a large or productive fossil occurrence has been		

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		uncovered by earthmoving and cannot be recovered without diverting the monitor from monitoring. Evaluate occurrence to determine if recovery is warranted. a. If recovery is warranted, notify construction contractor and Richland Communities of the necessity for implementing additional mitigation measures specified in DC/TP; initiate increased level of monitoring, if not already in effect, in immediate vicinity of fossil site and assigning additional personnel to PRIMP. b. Within 24 hours after approval, mobilize recovery crew to recover occurrence; supervise recovery of occurrence and its transport to laboratory facility or to a location elsewhere at site approved by the construction contractor for initial/field processing of a fossiliferous rock sample or to laboratory facility for preparation of a fossil specimen. c. If warranted and approved by construction contractor, enlist the assistance of the earth-moving equipment and operator to expedite recovery of occurrence. d. To obviate need for additional personnel and reduce any potential construction delay, after recovery of occurrence, have construction contractor allow earth moving to proceed through fossil site. e. Notify Richland Communities of recovery (or of decision not to recover fossil occurrence, if appropriate) and of authorization for earth moving to proceed through fossil site. 6) Responsibilities of the construction contractor and earth-moving equipment operators if fossil remains are uncovered by earthmoving, particularly if a monitor is not present at the site when the remains are encountered. a. Avoid disturbance of fossil site by earth moving.		

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		b. Notify monitor, the paleontologist, or the field supervisor and Richland Communities of the fossil occurrence. c. Avoidance of fossil site by earthmoving activities. d. Assist with equipment and operator to expedite recovery of occurrence. These measures will obviate need for additional personnel, reduce any potential construction delay, and allow for earthmoving to proceed through the site following approval by monitor. The construction contractor and Richland Communities staff will be shown examples of fossil specimens similar to those that might be encountered by earthmoving on-site. If warranted, the paleontologist or field supervisor and a monitor will give a similar presentation to the earth-moving equipment operators at one of their earliest safety meetings. The operators will be instructed on recognizing fossil remains in the field, informed of their responsibilities if they observe fossil remains when the monitor is not present at the site (avoid disturbance of occurrence by earthmoving; have construction contractor call monitor to fossil site; expedite recovery of occurrence, if requested), and advised that unauthorized collecting of fossil remains is illegal.		
	Reduced to below a level of significance	**4.4-14 Monitoring Earthmoving:** Earthmoving will be monitored by a palaeontologic monitor only in those areas of the site where earthmoving will disturb soils greater than five feet deep (monitoring will not be conducted in areas in which soils will be buried but not disturbed). Monitoring will not be implemented until earthmoving has reached a depth of five feet below current grade. Monitoring will consist of visually inspecting freshly exposed rock and debris for larger fossil remains and periodically dry test screening a small (25 pound) sample of rock and debris with a 20-mesh box screen for smaller vertebrate fossil remains. Monitoring will be conducted on a full-time basis. However, if too few or no fossil remains are uncovered by earthmoving in areas underlain by a particular rock unit, based on the professional recommendation of L&L, monitoring can be reduced to half or quarter time, generally, or suspended once 50 percent of earthmoving in the area underlain by the rock unit has been completed. Alternatively, if significant fossil remains are uncovered by earthmoving, based on the professional recommendation of L&L,	City of Menifee Planning Department; Project Paleontologist	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		monitoring may be increased in areas underlain by the fossil-bearing rock unit, at least in the immediate vicinity of the fossil site.		
	Reduced to below a level of significance	**4.4-15 Large-Specimen Evaluation and Recovery Options** 1) If a large fossil specimen (unable to be picked up easily by hand) is found as a result of monitoring earthmoving and the specimen can be recovered without significantly diverting the monitor from monitoring, earthmoving will be temporarily diverted around the fossil site and the specimen will be evaluated and, if warranted, excavated; covered with a protective plaster-impregnated burlap jacket, if required; and recovered. 2) If necessary and approved by the construction contractor, earth-moving equipment and an operator will be enlisted to expedite recovery of the specimen and obviate the need for additional personnel, and the construction contractor will be allowed to have earthmoving proceed through the fossil site immediately after recovery of the specimen. A temporary field number will be assigned to the specimen; the field number, a preliminary field identification, and pertinent specimen (field number, identification by taxon and element) and geologic (particularly stratigraphic level within rock unit) and geographic site data (location, elevation) will be recorded in the monitor's daily monitoring log; and the field number recorded and the fossil site location plotted on a map of the site. 3) At the end of the day the monitor or (following their next site inspection) the field supervisor will transport the fossil remains and associated data to a laboratory facility for further treatment (see Mitigation Measure 4.4-17). If appropriate, samples of fossil wood will be submitted for carbon-14 dating analysis. 4) If a fossil specimen is found and is sufficiently large that it cannot be recovered without significantly diverting the monitor from monitoring, the fossil site will be flagged with colored survey ribbon to temporarily divert earthmoving around the site, the construction contractor will be advised to avoid the site until further notice (usually less than 2 days), and the paleontologist or field supervisor will	City of Menifee Planning Department; Project Paleontologist	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		be called to the site. The grading contractor will notify Richland Communities and L&L of the occurrence and of the avoidance of the site. The paleontologist or field supervisor will evaluate the specimen for significance and continuity to determine if recovery is warranted. a. If specimen recovery is not warranted, no further action will be taken to preserve the fossil site or remains, the construction contractor will be allowed to have earthmoving proceed through the site immediately, and Richland Communities will be notified of the decision not to recover the specimen and of authorization for earthmoving to proceed through the fossil site. b. If specimen recovery is warranted, the paleontologist or field supervisor will notify the construction contractor, Richland Communities, and the City of Menifee Community Development Director of the necessity for implementing additional mitigation measures specified in the DC/TP; initiating full-time monitoring, if not already in effect, at least in the immediate vicinity of the site in areas underlain by the fossil-bearing rock unit; and assigning additional personnel to the PRIMP. Within 24 hours after Richland Communities' approval, as secured by L&L, a recovery crew will be mobilized to recover the specimen. The size of the crew will reflect the size of the specimen and the need to recover the specimen as quickly as possible. The specimen will be excavated with hand tools, covered with a protective plaster-impregnated burlap jacket, and recovered. If necessary and approved by the construction contractor, earth-moving equipment and an operator will be enlisted to expedite recovery of the specimen, reduce any potential construction delay, and obviate the need for additional personnel. The construction contractor will be allowed to have earthmoving proceed through the fossil site immediately after recovery of the specimen. Richland Communities will be notified of the recovery and of authorization for earthmoving to proceed through the fossil site. A temporary field		

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		number will be assigned to the specimen; the field number, a preliminary field identification, and pertinent specimen (field number, identification by taxon and element) and geologic (particularly stratigraphic level within rock unit) and geographic site data (location, elevation) will be recorded in the monitor's daily monitoring log; and the field number will be recorded and the fossil site location plotted on a map of the site. The field supervisor and, if necessary, a crew member will transport the fossil specimen and associated site data to a laboratory facility for further treatment (see Mitigation Measure 4.4-17).		
	Reduced to below a level of significance	**4.4-16 Small-Specimen Sample Evaluation, Recovery, and Processing.** If a sufficient number of smaller vertebrate fossil remains are found at one site as a result of test screening by the monitor, the fossil site will be flagged with colored survey ribbon to temporarily divert earthmoving around the site. The construction contractor will be advised to avoid that site until further notice (usually less than two days) and, if requested by the monitor, in order to expedite recovery of a fossiliferous rock sample, reduce any potential construction delay, and obviate the need for additional personnel, the construction contractor will have earth-moving equipment and an operator acquire a rock sample from the fossil site and transport the sample, if possible, to a nearby temporary location at the site approved by the construction contractor. The construction contractor will notify Richland Communities and L&L of the occurrence and of the avoidance of the fossil/storage site. If a sample is recovered, the construction contractor can continue earthmoving through the fossil site immediately after recovery of the sample. The monitor will notify Richland Communities of the recovery of the sample and of authorization for earthmoving to proceed through the fossil site. The paleontologist or field supervisor will be called to the fossil/storage site to determine if the fossil site/sample is sufficiently productive to warrant recovery of a large sample of fossiliferous rock to process for additional small remains. (Previous experience has demonstrated that only some fossil sites require sampling/sample processing, but more than 95 percent of the	City of Menifee Planning Department; Project Paleontologist	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		specimens recovered as a result of some mitigation programs were recovered as a result of sample processing.) 1) If the site/sample is determined too unproductive or the remains too poorly preserved or insufficiently diagnostic, no further action will be taken to preserve the fossil site/sample or remains, the construction contractor will be allowed to continue earthmoving through the fossil/storage site immediately, and Richland Communities will be notified of the decision not to recover/process a sample and of authorization for earthmoving to proceed through the fossil/storage site. 2) If sample recovery is warranted, the paleontologist or field supervisor will notify the construction contractor and the City of Menifee Community Development Director of the necessity for implementing additional mitigation measures specified in the DC/TP and assigning additional personnel to the PRIMP. a. Within 24 hours after approval, a recovery crew will be mobilized to recover the sample. The size of the crew will reflect the need to recover the sample as quickly as possible. The field supervisor will record the size and supervise recovery of the sample. Up to three tons of fossiliferous rock will be recovered. The sample will be excavated with hand tools for recovery. If necessary and if approved by the construction contractor, earth-moving equipment and an operator will be enlisted to expedite transportation of the sample to the processing facility site, obviate the need for additional personnel, and reduce any potential construction delay. The construction contractor will be allowed to have earthmoving proceed through the fossil site immediately after recovery of the sample. The paleontologist or field supervisor will notify Richland Communities of recovery of the sample and of authorization for earthmoving to proceed through the fossil site. b. A temporary field number will be assigned to the sample; the field number and pertinent specimen (field number, identification by taxon and element) and geologic (particularly stratigraphic level within rock unit) and geographic site data (location, elevation) will		

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		be recorded in the monitor's daily monitoring log; and the field number will be recorded and the fossil site location plotted on a map of the site. The field supervisor and, if necessary, a crew member will transport the sample to another location at the site approved by the construction contractor or to an off-site location for initial/field processing (wet screening) of the sample. The total weight of all samples from each fossil-bearing rock unit at the site will not exceed three tons. c. If warranted, the field supervisor will set up a field processing facility for wet screening the sample at a site location approved by the construction contractor. Wet screening will consist of sieving rock through a 20-mesh box screen (and/or finer) immersed in a tub of water to remove the smaller particles (clay and silt) from the larger particles (sand and rock) and small fossil remains. This could result in a reduction in sample weight/volume in excess of 90 percent. If necessary, rock will be soaked in an environmentally safe dispersant (citrus oil) prior to screening to improve separation of the clay particles from the rest of the sample during screening. The monitor will conduct wet screening if it can be accomplished without diverting the monitor from monitoring. If it is not possible to have the monitor perform the wet screening, a field technician will be assigned to the task. Following his next site inspection, the field supervisor will transport the concentrate (larger particles and small fossil remains) generated by initial processing to a laboratory facility for final/laboratory processing. d. If fossil remains in the concentrate are sufficiently fossilized (dense), an environmentally safe heavy liquid (sodium polytungstate), if appropriate, will be used by the senior vertebrate paleontologist to separate the remains from the remaining sand and rock particles. When added to a beaker filled with heavy liquid, the concentrate will separate, the particles floating to the surface, and the remains sinking to the bottom, from where they are retrieved. This technique can result in a further sample weight/volume reduction in excess of		

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		90 percent (less than 1 percent of original sample size). The final concentrate will be examined under a microscope and fossil specimens recovered from any remaining sand and rock particles. If the fossil bone in the original concentrate is not sufficiently dense for use of the heavy-liquid separation technique, the entire sample of concentrate will be sorted under a microscope for fossil remains. Recovered fossil remains will then be treated (see Mitigation Measure 4.4-17). e. During final processing of a sample, the senior vertebrate paleontologist will continually evaluate the results of field and laboratory processing. If the sample is insufficiently productive or the fossil remains are too poorly preserved, the senior vertebrate paleontologist will have the option of discontinuing further laboratory processing of the sample, having field processing of the remainder of the sample suspended, and disposing of the remainder of the sample and unprocessed concentrate. Similarly, processing will be discontinued if, after preliminary identification of some specimens, the remains are determined insufficiently diagnostic or diverse taxonomically, or the species represented are the same as those in another sample from the fossil-bearing rock unit. (Previous experience has demonstrated that only some fossil sites require sample processing, and only some of these sites require processing of an entire three-ton sample.) If appropriate, small splits from one or more samples will be submitted for palynological analysis.		
	Reduced to below a level of significance	**4.4-17 Fossil Treatment.** Final treatment of all fossil specimens recovered from the site as a result of the PRIMP will be conducted at a laboratory facility. Larger vertebrate fossil specimens will be removed from their protective jackets, prepared to the point of identification using hand tools, and hardened or stabilized with a penetrating solution by a preparator. All recovered fossil specimens will be identified to the lowest taxonomic level possible by knowledgeable vertebrate and invertebrate paleontologists and, if required, other knowledgeable paleontologists (e.g., paleobotanists, micropaleontologists, palynologists). The specimens will then be curated (assigned and labeled with museum specimen data and	City of Menifee Planning Department; Project Paleontologist	Upon commencement of grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		corresponding site numbers, placed in specimen trays and, if appropriate, vials with completed specimen data cards); catalogued (specimen and site numbers and specimen data and corresponding geologic and geographic site data, respectively, archived [entered into appropriate catalogs and computerized databases]); and accessioned into the museum fossil collection, where they will be permanently stored, maintained, and, along with associated data, made available for future study by qualified investigators. With the possible exception of tasks that might be conducted by museum staff (curation, cataloging), all treatment of fossil specimens will be conducted by a laboratory technician. Fossil specimen preparation, identification, curation, and cataloguing are now required before a fossil collection will be accepted by most museum repositories, including the WSC. Moreover, the scientific importance of a fossil specimen cannot be evaluated until the specimen has been identified to the lowest taxonomic level possible, and specimen identification often is not possible without prior preparation.		
	Reduced to below a level of significance	**4.4-18 Final Report.** A final technical report of findings will be prepared by the paleontologist and will describe the site's stratigraphy; summarize field and laboratory methods employed during the PRIMP; include a taxonomic list and an inventory of catalogued fossil specimens recovered as a result of the PRIMP; evaluate the scientific importance of the specimens; and discuss the relationship of the fossil assemblage from any newly recorded fossil site at the Project Site to relevant fossil assemblages from fossil sites in other areas. The report will be submitted to the contractor, Richland Communities, and the City of Menifee Community Development Director. Submission of the final report will signify completion of the PRIMP and will ensure Richland Communities' compliance with Public Resources Code Section 21081.6 (mitigation monitoring, reporting, and compliance).	City of Menifee Planning Department; Project Paleontologist	Upon completion of grading activities.
4.1.5 HYDROLOGY, FLOODING, AND DRAINAGE	Reduced to below a level of significance.	Mitigation is not required.	None	None
4.1.6 WATER QUALITY	Reduced to below a level of significance.	**4.6-1** The developer or builder for TTM No. 31194 shall be required, pursuant to requirements of the State Water Resources Control Board, to obtain a NPDES	City of Menifee Engineering and Public Works Department	Prior to the issuance of grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		construction permit prior to issuance of grading permits. The NPDES permit will apply to all construction activities associated with the proposed project. Construction activities include clearing, grading, or excavation that results in the disturbance of at least five acres of total land area or activity that is part of a larger common plan of development of one acre or greater. The permit requires the applicant to develop and implement a SWPPP that specifies BMPs to minimize pollutants in stormwater runoff and nonstorm water discharges. Examples of BMPs include but are not limited to installing energy dissipation structures and rip-rap at stormwater discharge points to stabilize flow and reduce velocities; mulching cleared or freshly seeded areas for erosion/sedimentation control; and using geotextiles and mats for erosion control during construction, storm drain inlet/outlet protection for siltation control; and slope drains for erosion control. The permit also requires a monitoring, reporting, and inspection program to be developed and implemented to ensure the effectiveness of the controls.		
	Reduced to below a level of significance	**4.6-2** Prior to approval of a Final Map and final engineering drawings, the City shall verify that the Final Map and engineering drawings indicate the size and location of the structural source control BMPs specified by the project's Water Quality Management Plan.	City of Menifee Engineering and Public Works Department	Prior to approval of Final Map and final engineering drawings.
	Reduced to below a level of significance	**4.6-3** Prior to issuance of occupancy permits, the City shall verify that the project's CC&Rs specify the homeowners association's ownership maintenance requirements for private storm drains and catch basins, as specified in the project's Water Quality Management Plan.	City of Menifee Engineering and Public Works Department	Prior to issuance of occupancy permits.
	Reduced to below a level of significance	**4.6-4** Prior to issuance of occupancy permits, the City shall verify that the project's CC&Rs contain the activity restrictions and the property owner environmental education awareness materials for water quality specified by the Project's Water Quality Management Plan.	City of Menifee Engineering and Public Works Department	Prior to issuance of occupancy permits.
4.1.7 GEOLOGY AND SLOPE STABILITY	Reduced to below a level of significance.	**4.7-1** Prior to the issuance of grading permits and in compliance with the requirements of City ordinances, a detailed geotechnical report(s) shall be submitted to the City's Engineering Division for review and approval. The report(s) shall identify and address site-specific (a) underlying soil conditions, (b) liquefaction potential, (c)	City of Menifee Engineering and Public Works Department	Prior to the issuance of grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		seismic parameters and building requirements, and (d) slope stability. The measures recommended by the final geotechnical report(s) shall be identified on applicable grading plans and shall be implemented to the satisfaction of the City Geologist.		
	Reduced to below a level of significance	**4.7-2** All earthwork and grading shall be performed in accordance with all applicable requirements of Chapter 8.26, Grading Regulations, of the Menifee Municipal Code, in addition to the provisions of the 2021 International Building Code. Grading shall also be performed in accordance with applicable provisions of the Standard Grading Specifications in the geotechnical reports prepared by Leighton and Associates (see Appendix G).	City of Menifee Engineering and Public Works Department	Concurrent with grading activities.
	Reduced to below a level of significance	**4.7-3** The project geotechnical engineer or qualified representative shall be notified at appropriate times to provide observation and testing services during clearing operations and to verify compliance with the recommendations made by the project geotechnical reports. In addition, any buried structures or unusual or adverse soil conditions encountered that are not described or anticipated in the project's geotechnical reports shall be brought to the immediate attention of the geotechnical consultant.	City of Menifee Engineering and Public Works Department	Concurrent with grading activities.
	Reduced to below a level of significance	**4.7-4** All existing low-density and potentially collapsible soil materials, such as loose manmade fill and alluvium, shall be removed to underlying competent bedrock from each area to receive compacted fill. Prior to placing structural fills, the exposed bottom surfaces in each removal area shall first be scarified to a depth of 6 inches or more, watered or air-dried as necessary to achieve near-optimum moisture conditions, and then recompacted in-place to a minimum relative compaction of 90 percent. Actual depths and horizontal limits of any removals shall be determined during grading on the basis of in-grading observations and testing performed by the project geotechnical consultant and/or engineering geologist.	City of Menifee Engineering and Public Works Department	Concurrent with grading activities and prior to the issuance of building permits.
	Reduced to below a level of significance	**4.7-5** In the event import soils are needed to achieve final design grades, all potential import materials shall be free of deleterious/oversize materials, non-expansive, and approved by the project geotechnical consultant prior to commencement of delivery onsite.	City of Menifee Engineering and Public Works Department	Concurrent with grading activities.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
	Reduced to below a level of significance	**4.7-6** An observation of clearing operations, removal of unsuitable surficial materials, and general grading procedures shall be performed by the project geotechnical consultant or his/her representative. Fill shall not be placed without prior approval from the geotechnical consultant. The project geotechnical consultant or his/her representative shall also be present on-site during all grading operations to verify proper placement and adequate compaction of all fill materials, as well as to verify compliance with the other recommendations presented in the project geotechnical reports.	City of Menifee Engineering and Public Works Department	Concurrent with grading activities.
	Reduced to below a level of significance	**4.7-7** No oversized rock (greater than 12 inches) shall be place within 10 feet of the finished grade.	City of Menifee Engineering and Public Works Department	Concurrent with grading activities.
	Reduced to below a level of significance	**4.7-8** Cut-and-fill slopes steeper than 3:1 (horizontal: vertical) and exceeding a vertical height of 30 feet shall be constructed with drainage terraces.	City of Menifee Engineering and Public Works Department	Concurrent with grading activities.
4.1.8 SOILS, SLOPES AND EROSION POTENTIAL	Reduced to below a level of significance.	**4.8-1** Prior to the issuance of a grading permit, an overall Conceptual Grading Plan shall be submitted for City of Menifee Engineering and Public Works Department approval. The Grading Plan shall include: 1) techniques employed to prevent erosion and sedimentation during and after the grading process; 2) approximate time frames for grading; 3) identification of areas which may be graded during high probability rain months (January through March); and 4) preliminary pad and roadway elevations.	City of Menifee Engineering and Public Works Department	Prior to the issuance of grading permits.
	Reduced to below a level of significance.	**4.8-2** Where cut-and-fill slopes are created higher than three feet, detailed landscaping and irrigation plans shall be submitted to the City of Menifee Planning Department or City of Menifee Engineering and Public Works Department prior to Grading Plan approval. The plans shall be reviewed for type and density of ground cover, shrubs, and trees to ensure that plant material would be effective as erosion control and that all slopes would be landscaped per the City's Development Code.	City of Menifee Planning Department or City of Menifee Engineering and Public Works Department	Prior to issuance of grading permits.
	Reduced to below a level of significance	**4.8-3** All grading procedures shall be in compliance with the Chapter 8.26, of the City's Development Code, including requirements for erosion control during rainy months.	City of Menifee Engineering Division.	Prior to issuance of grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		The requirements for compliance with the City's Site Development Regulations and Performance Standards shall be noted on all grading plans.		
	Reduced to below a level of significance	**4.8-4** Graded, but undeveloped land shall be maintained weed-free and planted with interim landscaping within 90 days of completion of grading, unless building permits are obtained.	City of Menifee Engineering and Public Works Department	Upon completion of grading activities.
	Reduced to below a level of significance	**4.8-5** Prior to any grading activities, a soils report and geotechnical study shall be performed to further analyze on-site soil conditions and slope stability and shall include the appropriate measures to control erosion.	City of Menifee Engineering and Public Works Department	Prior to issuance of grading permits.
	Reduced to below a level of significance	**4.8-6** Potential brow ditches, terrace drains, or other minor swales determined necessary by the City of Menifee at future stages of project review, shall be lined with natural erosion control materials or concrete.	City of Menifee Engineering and Public Works Department	Prior to the issuance of grading permits.
	Reduced to below a level of significance	**4.8-7** The locations of potentially compressible soils shall be identified on all Grading Plans. Where development is proposed in areas of compressible soils, deep foundation systems shall be used, or compressible soils shall be completely over excavated and compacted.	City of Menifee Engineering and Public Works Department	Prior to the issuance of grading permits.
4.1.9 AGRICULTURE	Reduced to below a level of significance.	**4.9-1** The project shall comply with the County's "Right to Farm" Ordinance (Ordinance No. 625). The ordinance is intended to provide for a means of giving notice to prospective buyers of homes in newly built subdivisions and recently subdivided parcels that they are moving into an agricultural area and that a farm has been in operation legally for at least three years shall not be or become a nuisance simply because residential uses have entered the area and are offended by the odors, dust, etc.	City of Menifee Planning Department	Prior to issuance of occupancy permits.
4.1.10 MINERAL RESOURCES	Not significant.	Mitigation is not required.	None	None

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
4.1.11 TOXIC SUBSTANCES	Reduced to below a level of significance.	**4.11-1** Users of household hazardous materials such as paints, roofing materials and solvents during construction shall comply with applicable federal, state, and local regulation requiring elimination and reduction of waste at the source by prevention of leakage, by segregation of hazardous waste, and by process of materials change.	Riverside County Department of Environmental Health	Prior to the issuance of building permits.
	Reduced to below a level of significance	**4.11-2** All site improvements not removed from the property by the current owner shall be disposed of offsite, in accordance with current local, state, and federal disposal regulations. Any petroleum contaminated materials, lead-based paints or products, mercury, asbestos containing materials and/or buried trash/debris encountered during removal and/or grading shall be evaluated by an experienced environmental consultant prior to removal.	Riverside County Department of Environmental Health	Prior to the issuance of grading permits.
	Reduced to below a level of significance	**4.11-3** In the event that any subsurface hazardous materials, including soil and/or groundwater contamination, are found during grading or construction, all activity in the area of discovery and/or in an appropriate radius of the area of discovery shall temporarily cease and the County of Riverside Environmental Health Department shall be notified prior to the resumption of any construction activity in the area of discovery, the site shall be deemed safe by the appropriate entity prior to the resumption of grading and/or constructions activities.	Riverside County Department of Environmental Health	Concurrent with grading and construction activities.
	Reduced to below a level of significance	**4.11-4** If soil is to be imported or exported to or from the site during grading or other construction activities, the transported soil it shall be sampled for contaminants assessed prior to proposed off-site use or disposal. Imported soil shall be free from contamination. Exported soil, if contaminated, shall be and handled in accordance with prevailing environmental laws and regulations, including Land Use Disposal Restrictions, if applicable.	Riverside County Department of Environmental Health	Concurrent with grading and construction activities.
	Reduced to below a level of significance	**4.11-5** Prior to the issuance of grading permits, soil sampling shall occur to identify levels of methane, pesticides, herbicides, fertilizer, and other agricultural chemicals. Methane and chemical levels shall be verified to be within allowable limits as regulated by prevailing environmental laws and regulations prior to the issuance of building permits.	Riverside County Department of Environmental Health	Prior to the issuance of grading and building permits.

Appendix B. 2022 EIR Addendum - Mitigation Monitoring and Reporting Program

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
4.1.12 CIRCULATION AND TRAFFIC	Reduced to below a level of significance	**4.12-1** Wickerd Road shall be constructed from the easterly project boundary to the westerly project boundary to align with Garbani Road at its ultimate full-section width as a Major roadway.	City of Menifee Engineering and Public Works Department	Prior to issuance of building and occupancy permits
	Reduced to below a level of significance	**4.12-2** Garbani Road shall be constructed as a paved two- lane extension from Evans Road to the westerly project to provide site access with a minimum of a 32 foot pavement section.	City of Menifee Engineering and Public Works Department	Prior to issuance of building and occupancy permits
	Reduced to below a level of significance	**4.12-3** Wickerd Road shall be constructed as a paved two- lane extension from the easterly project boundary to Haun Road to provide site access with a minimum of a 32 -foot pavement section.	City of Menifee Engineering and Public Works Department	Prior to issuance of building and occupancy permits
	Reduced to below a level of significance	**4.12-4** Internal roadways shall be constructed as Collector Roadways in accordance with the City of Menifee Public Works Department standards.	City of Menifee Engineering and Public Works Department	Prior to issuance of building and occupancy permits
	Reduced to below a level of significance	**4.12-5** On-site traffic signing and striping shall be implemented in conjunction with detailed construction plans for the project site.	City of Menifee Engineering and Public Works Department	Concurrent with project implementation.
	Cumulatively significant impacts to freeway mainline segments.	**4.12-6** Sight distance at each project access roadway shall be reviewed with respect to standard City of Menifee sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.	City of Menifee Engineering and Public Works Department	Concurrent with project implementation.
4.1.13 AIR QUALITY	Reduced to below a level of significance	**Construction Activities** **4.13-1** Prior to the issuance of grading permits, the owner/permittee shall submit an accelerated construction dust abatement management program to the City of Menifee. This involves developing a dust control program to supplement the routine watering that constitutes best available control measures (BACM) in excess of any minimum SCAQMD Rule 403 requirements. BACMs that may be adopted and integrated into an enhanced dust control program might include hydroseeding previously disturbed areas while awaiting construction, adding chemical binders or surfactants to increase the effectiveness of watering, and/or early paving or chip	City of Menifee Building and Safety Department; South Coast Air Quality Management District	Prior to the issuance of grading permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		sealing of roads. Soil disturbance should be terminated when high winds (>25 mph) make dust control extremely difficult.		
	Reduced to below a level of significance	**4.13-2** The project applicant/contractor shall reduce "spill- over" effects by preventing soil erosion, washing dirt from vehicles entering public roadways, and washing/sweeping project access to public roadways on a regular schedule.	City of Menifee Building and Safety Department	Concurrent with grading and construction activities.
	Reduced to below a level of significance	**4.13-3** All trucks hauling dirt, sand, soil, or other loose materials are to be covered or shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114.	City of Menifee Building and Safety Department	Concurrent with grading and construction activities.
	Direct and cumulatively significant and unmitigable: NOx (construction equip. exhaust) VOC (arch. surface coatings)	**Construction Emissions (NOx)** **4.13-4**(A) Prior to construction commencement for each phase of the proposed development, emissions control from on-site equipment through a routine mandatory program of low emissions tune-ups shall be required. (B) Electric or natural gas powered construction equipment shall be used as feasible as determined by the construction superintendent. Diesel-powered (C) During construction, electricity should be used from power poles instead of from portable generators as feasible as determined by the construction superintendent.	City of Menifee Building and Safety Department	Prior to commencement of grading and construction activity phases.
	Direct and cumulatively significant and unmitigable: NOx (construction equip. exhaust) VOC (arch. surface coatings)	**Volatile Organics (VOC)** **4.13-5**The application of architectural surface treatments (i.e., paint, etc.) shall be limited to 100 gallons per day over the project buildout lifetime using the most currently required low-VOC paint (100 grams or less of VOC per liter) and high pressure-low volume (HPLV) paint applicators.	City of Menifee Building and Safety Department	Concurrent with construction activities.
4.1.14 NOISE	Reduced to below a level of significance.	**Short-Term Construction Impacts** **4.14-1**Construction activities shall comply with Menifee Municipal Code Section 8.01.101relating to construction noise.	City of Menifee Building and Safety Department	Concurrent with grading and building permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
	Reduced to below a level of significance.	**4.14-2** Construction shall be restricted to the hours of 6:30 am to 7:00 pm weekdays and Saturdays.	City of Menifee Building and Safety Department	Concurrent with grading and building permits.
	Reduced to below a level of significance.	**4.14-3** If blasting, drilling or rock crushing occur within 800 feet of any occupied residence, temporary noise barriers (berms, walls, etc.) shall be erected to mitigate noise from these activities to an exterior noise level of 65 dB(A) or less at the nearest residential lot line.	City of Menifee Building and Safety Department	Concurrent with grading and building permits.
	Reduced to below a level of significance.	**4.14-4** Prior to any blasting operations, all residences within 800 feet of any potential blast location shall be notified in writing of the blasting schedule, and again within a minimum of 72 hours in advance of blasting.	City of Menifee Building and Safety Department	Concurrent with grading and building permits.
	Reduced to below a level of significance.	**4.14-5** All construction vehicles or equipment, whether fixed or mobile, shall be equipped with properly operating and maintained mufflers.	City of Menifee Building and Safety Department	Concurrent with grading and building permits.
	Reduced to below a level of significance.	**4.14-6** Stockpiling and/or vehicle staging areas shall be located as far as practical from occupied residences.	City of Menifee Building and Safety Department	Concurrent with grading and building permits.
	Reduced to below a level of significance.	**Long-Term Potential Noise Impacts** **4.14-7** Prior to the issuance of occupancy permits for affected lots, solid barriers (walls, berms or a combination thereof) shall be provided in the following locations: a. 7.5-foot-high masonry block walls or combination berm and block wall shall be constructed along Lots 61-63 and 72-84 of TTM 31194-1 on Wickerd Road. b. 7-foot-high masonry block walls or combination berm and block wall shall be constructed along Lots 3-4, 15-16, 24-25, 31-32, of TTM 31194-1, Lots 1, 3-7 of TTM 31194-2 and Lots 1-4, 114-138 and 251-259 of TTM 31194-4 on Wickerd Road. c. 6-foot-high masonry block wall/privacy wall or combination berm and block wall shall be constructed along Lots 31-43 of TTM 31194-3 on Evans Road.	City of Menifee Building and Safety Department	Concurrent with grading and building permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		d. Corner Wrap Around and Open Space Lots. Masonry block walls or combination berm and block wall shall be constructed along those lots along Wickerd Road that have been identified in the County's review of the acoustical analysis. The height shall be determined by the adjacent wall height. These walls shall be erected so that the top of each wall extends at least 6 to 7.5 feet (depending on location) above the pad elevation of the shielded lot. In cases where the road is elevated above the pad, the wall shall extend at least 6 to 7.5 feet (depending on location) above the highest point between the homes and the road. Final noise barrier heights shall be determined when final grading plans show lot location, precise road, and pad elevations.		
	Reduced to below a level of significance.	**4.14-8** Mechanical ventilation (e.g. air conditioning) shall be provided for all homes located adjacent to Wickerd Road and Evans Road.	City of Menifee Building and Safety Department	Concurrent with grading and building permits.
	Reduced to below a level of significance.	**4.14-9** Upgraded windows with a Sound Transmission Class (STC) rating 30 or higher shall be installed in all homes located adjacent to Wickerd Road.	City of Menifee Building and Safety Department	Concurrent with grading and building permits.
	Reduced to below a level of significance.	**4.14-10** To minimize the potential interior noise impacts, homes facing Wickerd Road and Evans Road should be provided with weather-stripped solid core exterior doors and exterior wall/roof assembles free of cut-outs and openings	City of Menifee Building and Safety Department	Concurrent with grading and building permits.
	Reduced to below a level of significance.	**4.14-11** Prior to issuance of building occupancy permits, the applicant shall provide the City of Menifee Building and Safety Department with an interior acoustical report for review and approval. The report must demonstrate that the interior noise of those homes along Wickerd Road and Evans Road has been reduced to at or below 45 Ldn.	City of Menifee Building and Safety Department	Prior to issuance of occupancy permits. Concurrent with construction activities.
4.1.15 OPEN SPACE, PARKS, AND RECREATION	Not significant.	Mitigation is not required.	None	None
4.1.16 FIRE PROTECTION	Reduced to below a level of significance.	**4.16-1** In accordance with Riverside County Subdivision Ordinance 460, fire flows shall have 1000 gallons per minute at 20 psi residual pressure.	Riverside County Fire Department	Prior to the issuance of building permits or water improvement plans.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
	Reduced to below a level of significance.	**4.16-2** All water mains and fire hydrants shall be constructed in accordance with Ordinance 460. Hydrant spacing at each intersection shall be no more than 330 feet apart.	Riverside County Fire Department	Prior to the issuance of building permits or water improvement plans.
	Reduced to below a level of significance.	**4.16-3** Disclosures of potentially damaging wildfires in the area must be disclosed to future homebuyers by the seller as part of the buyer disclosure statements prior to purchase as required by the California Civil Code.	Riverside County Fire Department	Prior to the issuance of occupancy permits.
	Reduced to below a level of significance.	**4.16-4** Prior to issuance of the grading permits, a fire protection/vegetation management plan shall be prepared and submitted to the Fire Department for review and approval.	Riverside County Fire Department	Prior to the issuance of grading permits.
	Reduced to below a level of significance.	**4.16-5** Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the City Development Impact Fee (DIF) Ordinance (Ord. No. 17-232), which requires a fee payment that the City applies to the funding of public facilities, including fire protection facilities.	Riverside County Fire Department	Prior to the issuance of occupancy permits.
4.1.17 POLICE SERVICES	Reduced to below a level of significance.	**4.17-1** Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the City's Development Impact Fees (DIF) Ordinance (Ord. No. 17-232), which requires a fee payment that the City applies to the funding of public facilities, including police protection facilities.	Riverside County Planning Department	Prior to the issuance of building permits.
	Reduced to below a level of significance.	**4.17-2** The project applicant shall inform the Problem Oriented Policing (POP) Unit of the City of Menifee's Police Department of all new homeowners associations. These associations may be used as the foundation for establishing Neighborhood Watch Programs.	City of Menifee Police Department	Prior to the issuance of occupancy permits
4.1.18 SOLID WASTE	Reduced to below a level of significance.	**4.18-1** The refuse hauler for the Project Site shall be advised of the efforts the developer will be pursuing relating to recycling and waste reduction (e.g., curbside recycling) in accordance with Chapter 6.30, Solid Waste Disposal and Organic Waste Diversion, of the Menifee Municipal Code. The use of such programs would be encouraged by the developer through information (location, materials accepted, etc.) provided in sales literature.	City of Menifee Engineering and Public Works Department	Prior to the issuance of occupancy permits

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
	Reduced to below a level of significance.	**4.18-2** The project applicant shall participate in established citywide programs to reduce solid waste generation.	City of Menifee Engineering and Public Works Department	Prior to the issuance of occupancy permits.
	Reduced to below a level of significance.	**4.18-3** The master Homeowners' Association and/or landscape maintenance district or association shall either mulch (shred and leave on landscaped areas), compost on-site, or separate from other types of waste to send to a composting facility within the local area, green waste (i.e., trimmings from grass, shrubs, or trees) from common project landscaped areas and the community park.	City of Menifee Engineering and Public Works Department	Prior to the issuance of occupancy permits.
	Reduced to below a level of significance.	**4.18-4** The project developer shall pursue and implement any available and feasible source reduction programs for the disposal of construction materials to the satisfaction of the City of Menifee's Solid Waste and Recycling Department.	City of Menifee Engineering and Public Works Department	Prior to the issuance of occupancy permits.
	Reduced to below a level of significance.	**4.18-5** The project applicant shall comply with the State Model Ordinance, which requires adequate areas for the collection and loading of recyclable materials to be provided within detached, single family residential areas where solid waste is collected and loaded in a location which serves five or more units.	City of Menifee Engineering and Public Works Department	Prior to the issuance of building permits.
4.1.19 WATER AND WASTEWATER SERVICES	Not significant.	Mitigation is not required.	None	None
4.1.20 SCHOOLS	Reduced to below a level of significance.	**4.20-1** Prior to the issuance of each residential building permit(s), school fees shall be paid in accordance with the requirements of the State of California (Senate Bill 50) or the applicant shall enter into a mitigation agreement with the Menifee Union School District and the Perris Union High School District.	Menifee Union School District; Perris Union High School District	Prior to the issuance of building permits.
4.1.21 LIBRARIES	Reduced to below a level of significance.	**4.21-1** Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the City Development Impact Fee (DIF)(Resolution No. 17-232), which requires a fee payment that the City applies to the funding of public facilities, including library facilities.	City of Menifee Planning Department	Prior to the issuance of building permits.
4.1.22 HEALTH CARE SERVICES	Reduced to below a level of significance.	**4.22-1** Prior to the issuance of occupancy permits, the applicant shall comply with the provisions of the City Development Impact Fee (DIF)(Resolution No. 17-232), which	City of Menifee Planning Department	Prior to the issuance of building permits.

IMPACTS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	MITIGATION MEASURES	RESPONSIBLE PARTY / MONITORING PARTY	IMPLEMENTATION STAGE
		requires a fee payment that the City applies to the funding of public facilities, including public health facilities.		
4.1.23 ENERGY RESOURCES	Not significant.	Mitigation is not required.	None	None
4.1.24 UTILITIES	Not significant.	Mitigation is not required.	None	None
4.1.25 DISASTER PREPAREDNESS – Fire Hazards	Reduced to below a level of significance.	See *Fire Protection,* above.		
Seismic Hazards		See *Soils and Erosion* and *Geology and Slope Stability*, above		
Soils and Erosion		See *Soil and Erosion*, above.		
Flooding		See *Hydrology, Flooding and Drainage,* above.		

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Appendix C. Updated Biological Assessment Reports and Jurisdictional Delineation

L&L ENVIRONMENTAL, INC.
REGULATORY SERVICES
BIOLOGICAL & CULTURAL INVESTIGATIONS & MONITORING

FINAL

UPDATED BIOLOGICAL RESOURCES ASSESSMENT, BOTANICAL, BURROWING OWL, AND NESTING RAPTOR SURVEYS, AND RIPARIAN BIRD HABITAT ASSESSMENT GOLDEN MEADOWS PROJECT, TRACT 31194, CITY OF MENIFEE, CALIFORNIA

±204.65-Acre Property, ±4.68 Acres Offsite, ±209.33 Acres Surveyed

APNs 360-300-002, -003, -004, -005, -006, -009, 360-350-001, and portions of offsite 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -024, 360-360-009, -010, -011, and 360-380-004, Tract 31194, Township 6 South, Range 3 West, Sections 15 and 16, USGS Romoland, 7.5' Topographic Quadrangle

Prepared For:

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Report Summary:

The Project site is in the area covered by the MSHCP but is not in the Criteria Area. The site is mainly agricultural land and disturbed/ruderal areas with some coastal scrub, chaparral, and scattered riparian vegetation. One sensitive vegetation community is present, arroyo willow thickets. No listed plant species observed. Two special status plants, long-spined spineflower and southern California black walnut observed. One immature coast live oak and other trees present. Coastal California gnatcatcher present and nesting on the site. White-tailed kite observed foraging but no nesting. No vernal pools or fairy shrimp habitat. Riparian birds considered absent. Several special status wildlife species observed. One burrowing owl and occupied burrow observed in 2018 but not present in 2021. A preconstruction survey is required. Habitat suitable for nesting birds is present and preconstruction clearance survey and avoidance buffers recommended during the nesting season. Site is not within a wildlife corridor. Jurisdictional and MSHCP riparian/riverine areas present. Regulatory permits and a DBESP required.

Surveys Conducted By: Guy Bruyea and John Konecny

Surveys Conducted: May – November 2021

Report Date: October 2017, updated October 2018, July 2019, November 2021, revised December 2021

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MANAGEMENT SUMMARY

L&L Environmental, Inc. (L&L) conducted biological surveys on Richland Communities' ±204.65-acre Golden Meadows Project site (and associated offsite improvement areas of ±4.68 acres) in the City of Menifee, California. The Project consists of construction of 572 single-family residential lots and associated roads and infrastructure. A blue-line stream runs through the site and the Project includes an Avoidance Area along the stream that will retain native habitat and natural flows. Open space will also be retained in the northeast corner of the site. An Environmental Impact Report (EIR) for the Project was published in 2006.

L&L has performed biological surveys on this property since 2003. The purpose of this study was to examine the site to determine presence/absence of biological resources on the property and potential for special status species to occur, as well as update previous survey results. Surveys in 2021 included a biological resources assessment/habitat assessment, focused botanical survey, protocol breeding season burrowing owl survey, nesting raptor survey, and riparian bird habitat assessment. This study reflects the most current field conditions and, where appropriate, makes comparative statements regarding past observed conditions.

The site is within the area covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP requires habitat assessments, and focused surveys if suitable habitat is present, for riparian/riverine resources and associated species and burrowing owl (*Athene cunicularia*). There is one area of Public/Quasi-Public (PQP) Conserved Lands approximately 0.68 miles north-northeast of the site, identified as the Ringing Rock Archaeological Site. Other than the Ringing Rock Site, there are no PQP or MSHCP Conserved Lands within a mile of the site. The site is not within or near any MSHCP Core Areas or Linkages.

The site consists mainly of cultivated agricultural fields (dry-farmed wheat) and disturbed/ruderal areas with some areas of disturbed to relatively undisturbed California buckwheat scrub and chamise chaparral. The ephemeral blue-line stream runs through the agricultural fields and includes scattered and degraded riparian vegetation (arroyo willow thickets and mulefat thickets). Arroyo willow thicket is a sensitive vegetation community. No vernal pools or ponding areas were observed.

Land use adjacent to the site includes anthropogenic disturbances such as rural residential development, agricultural areas, unimproved roads, powerline easements, off-highway vehicle (OHV) activity, and trash dumping.

No state or federally listed threatened or endangered plant species were observed on the site. Two (2) special status plant species were observed, southern California black walnut (*Juglans californica*) and long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*). Five (5) black walnut trees are present within the riparian area on the site. Two long-spined spineflower plants were present in 2017 but the species has not been observed during subsequent surveys. Both of these species are covered under the MSHCP and considered adequately conserved. No other special status plants were observed onsite during previous or current surveys, but three (3) species have a low to moderate or moderate potential to occur: smooth tarplant (*Centromadia pungens ssp. laevis*), Parry's spineflower (*Chorizanthe parryi var. parryi*), and small-flowered morning-glory (*Convolvulus simulans*). All of these species are covered under the MSHCP and considered adequately conserved.

There is a single immature coast live oak tree and a number of other native and non-native trees on the site, mainly in the riparian area. The City may regulate removal or replacement of trees and a tree survey may be required.

Previous and current surveys have documented coastal California gnatcatchers (*Polioptila californica californica*) present on the Project site and nesting has been observed. This species is federally listed as threatened. All observations were in the California buckwheat scrub habitat in the northeastern portion of the site. Coastal California gnatcatcher is a covered species under the MSHCP and considered adequately conserved. Under the MSHCP, focused surveys for this species are not required.

Two white-tailed kites (*Elanus leucurus*) were observed on the Project site in 2005 and one in 2011, but this species has not been observed on the site during more recent surveys. This species is fully protected in California. The EIR includes a mitigation measure (4.3-5) requiring a nesting raptor survey prior to issuance of grading permits and a CDFW Incidental Take Permit (2080 permit) if white-tailed kite are documented as nesting on the Project site. The California Natural Diversity Database (CNDDB) has documented occurrences of five (5) white-tailed kite nests within 10 miles of the Project site but no white-tailed kite nesting has been observed onsite. White-tailed kite is a covered species under the MSHCP and considered adequately conserved.

No vernal pools, ponding areas, or potential habitat for fairy shrimp were observed. The riparian vegetation on the site is scattered and degraded and there is no suitable habitat for least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), or western yellow-billed cuckoo (*Coccyzus americanus occidentalis*).

Two other listed species have a moderate or high potential to occur on the Project site, although they have not been observed: Stephens' kangaroo rat (*Dipodomys stephensii*) and tricolored blackbird (foraging) (*Agelaius tricolor*). Both of these species are covered under the MSHCP and considered adequately conserved. Under the MSHCP, focused trapping surveys for Stephens' kangaroo rat are not required.

Habitat suitable for use by burrowing owl is present on much of the property but is regularly disturbed by agricultural activities. There were no observations of burrowing owls during biological surveys of the site in 2003, 2004, 2005, 2006, 2011, 2013, and 2017. Surveys in 2018 observed one burrowing owl and an active burrow. The owl was observed during the survey on May 30, 2018 but was not observed during subsequent surveys. Focused surveys in 2019 and 2021 did not detect any burrowing owl, occupied burrows, or owl sign. A preconstruction clearance survey for burrowing owl (valid for 30 days) will be required.

Other special status wildlife species have observed on the site during previous and current surveys: coast horned lizard (*Phrynosoma blainvillii*), orange-throated whiptail (*Aspidoscelis hyperythra*), coastal (western) whiptail (*Aspidoscelis tigris stejnegeri*), Cooper's hawk (*Accipiter cooperii*), northern harrier (*Circus hudsonius*), California horned lark (*Eremophila alpestris actia*), great egret (*Ardea alba*), great blue heron (fly over) (*Ardea herodias*), Lawrence's goldfinch (*Spinus lawrencei*), loggerhead shrike (*Lanius ludovicianus*), California thrasher (*Toxostoma redivivum*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), Bell's sage sparrow (*Artemisiospiza belli belli*), Nuttall's woodpecker (*Dryobates nuttallii*), wrentit (*Chamaea fasciata*), Costa's hummingbird (*Calypte costae*), rufous hummingbird (*Selasphorus rufus*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*).

All of these species are covered under the MSHCP and considered adequately conserved except great egret, Lawrence's goldfinch, California thrasher, Nuttall's woodpecker, wrentit, Costa's hummingbird, and rufous hummingbird, which are not covered under the MSHCP.

Five (5) additional special status wildlife species have not been observed on the Project site during surveys but have a low to moderate potential to occur: Crotch bumble bee (*Bombus crotchii*), southern California legless lizard (*Anniella stebbinsi*), Dulzura pocket mouse (*Chaetodipus californicus femoralis*), northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), and western mastiff bat (foraging) (*Eumops perotis californicus*). Northwestern San Diego pocket mouse is covered under the MSHCP and considered adequately conserved. The remaining four species are not covered under the MSHCP. Crotch bumble bee was previously

a candidate for state listing, but its status is currently in litigation. If this species becomes listed, focused surveys and incidental take permitting may be required.

Nesting birds are protected under State and federal laws and habitat suitable for nesting birds (including raptors) is present within and around the site. Scheduling Project activities outside the nesting season (generally February 1 through August 31) or conducting preconstruction nesting bird clearance surveys and establishing avoidance buffers around any active nests is recommended. If nesting birds are present, an avoidance buffer of 300 to 500 feet (or as recommended by a biologist) should be established around active nests until juvenile birds have fledged and/or a biologist has verified that the nest has become inactive.

The Project site is largely surrounded by scattered existing development and there is no connectivity between the site and conserved lands to the east (Diamond Valley Lake) and southwest (Santa Rosa Plateau, Cleveland National Forest). Although there may be limited local movement of wildlife across the site, it is not within or adjacent to a wildlife corridor.

An ephemeral blue-line stream is present on the site and includes state waters and wetlands, federal waters, and MSHCP riparian/riverine habitat. All jurisdictional areas onsite will either be impacted by development or incorporated into the Avoidance Area. The Avoidance Area will retain native riparian habitat and natural flows. Regulatory permits from the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) will be required for impacts to jurisdictional areas. A Determination of Biologically Equivalent or Superior Preservation (DBESP) will be required for impacts to MSHCP riparian/riverine habitat.

Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys.

1.0) INTRODUCTION

This report was prepared by L&L Environmental, Inc. (L&L) for Richland Communities. It describes the results of biological surveys conducted on a proposed residential development site located within the City of Menifee, Riverside County, California. The Project site consists of Assessor's Parcel Numbers (APNs) 360-300-002, -003, -004, -005, -006, -009, and 360-350-001 (totaling ±204.65 acres) and portions of APNs 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -024, 360-360-009, -010, -011, and 360-380-004 where offsite improvements are planned (totaling ±4.68 acres).

The 2021 updated assessment consisted of (1) a records search and literature review, conducted to determine the species of concern in the Project area and proximity to closest documented special status species observations, (2) field surveys to identify plants and wildlife on the site and assess presence/absence of habitat for species of concern, (3) a focused botanical survey, (4) a protocol breeding season survey for burrowing owl, and (4) a habitat assessment for riparian birds.

1.1) Project Description

The Project is identified as Golden Meadows (formerly known as Menifee Assemblage), Tract No. 31194, and consists of construction of 572 single-family residential lots and associated roads and infrastructure (Figure 3b). The Project will be constructed in four (4) phases. Offsite impacts include improvements to existing roads and installation of flood control structures. The site plan is provided in Appendix E. An Environmental Impact Report for the Project was published in 2006 (T&B 2006).

The property also includes an Eastern Municipal Water District (EMWD) tank site. The proposed tank site includes two large water tanks and an access road. The tanks will serve multiple developments, including Golden Meadows. The tank site is located within the tract boundary, but it is not within the proposed Project boundary and is not a part of the Project.

The Project includes an Avoidance Area along the blue-line stream that retains native habitat and natural flows. Open space will also be retained in the northeast corner of the site.

1.2) Location

The site is located in Paloma Valley, west of the Interstate 215 freeway (I-215), south of Newport Road, and east of Murrieta Road (Figure 1). It is located between Wickerd Road to the south and Garbani Road to the north. The site is situated in Sections 15 and 16, Township 6 South, Range 3 West, within the USGS *Romoland* 7.5' series quadrangle map (Figure 2).

The site is generally bounded as follows: to the west by agricultural lands, Evans Road (unimproved), rural residential areas, and a school; to the east by a mixture of disturbed and relatively undisturbed vacant land, Sherman Road (unimproved), and a Frontier Communications building complex and Haun Road beyond; to the north by a mixture of disturbed and relatively undisturbed vacant lands, rural residential areas, Garbani Road (unimproved), and residential developments; and to the south by Wickerd Road (unimproved), and a mix of disturbed and relatively undisturbed vacant lands and rural residential areas (Figure 3a).

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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
December 2021

Figure 1

Project Vicinity Map

Golden Meadows, TT 31194
City of Menifee, California

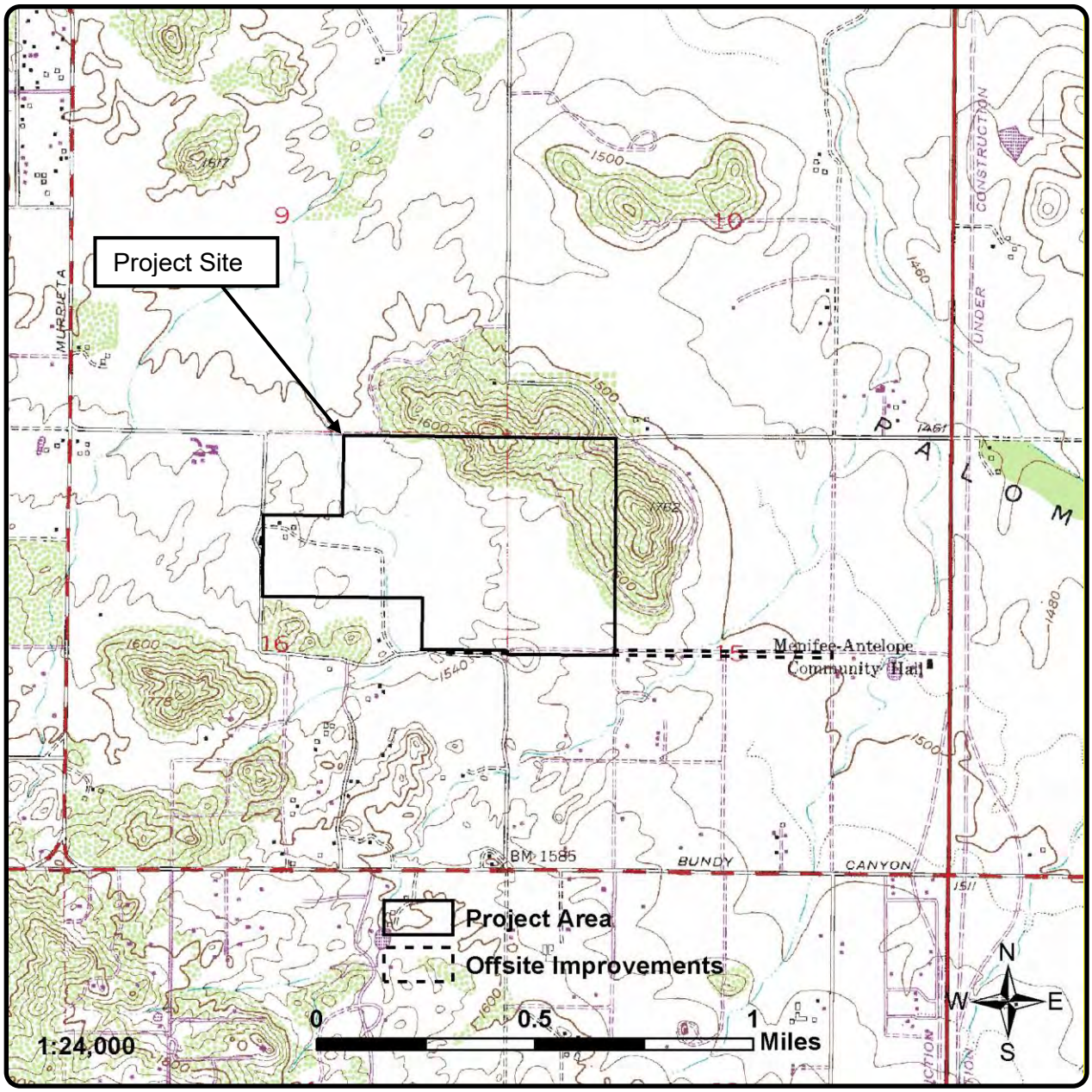

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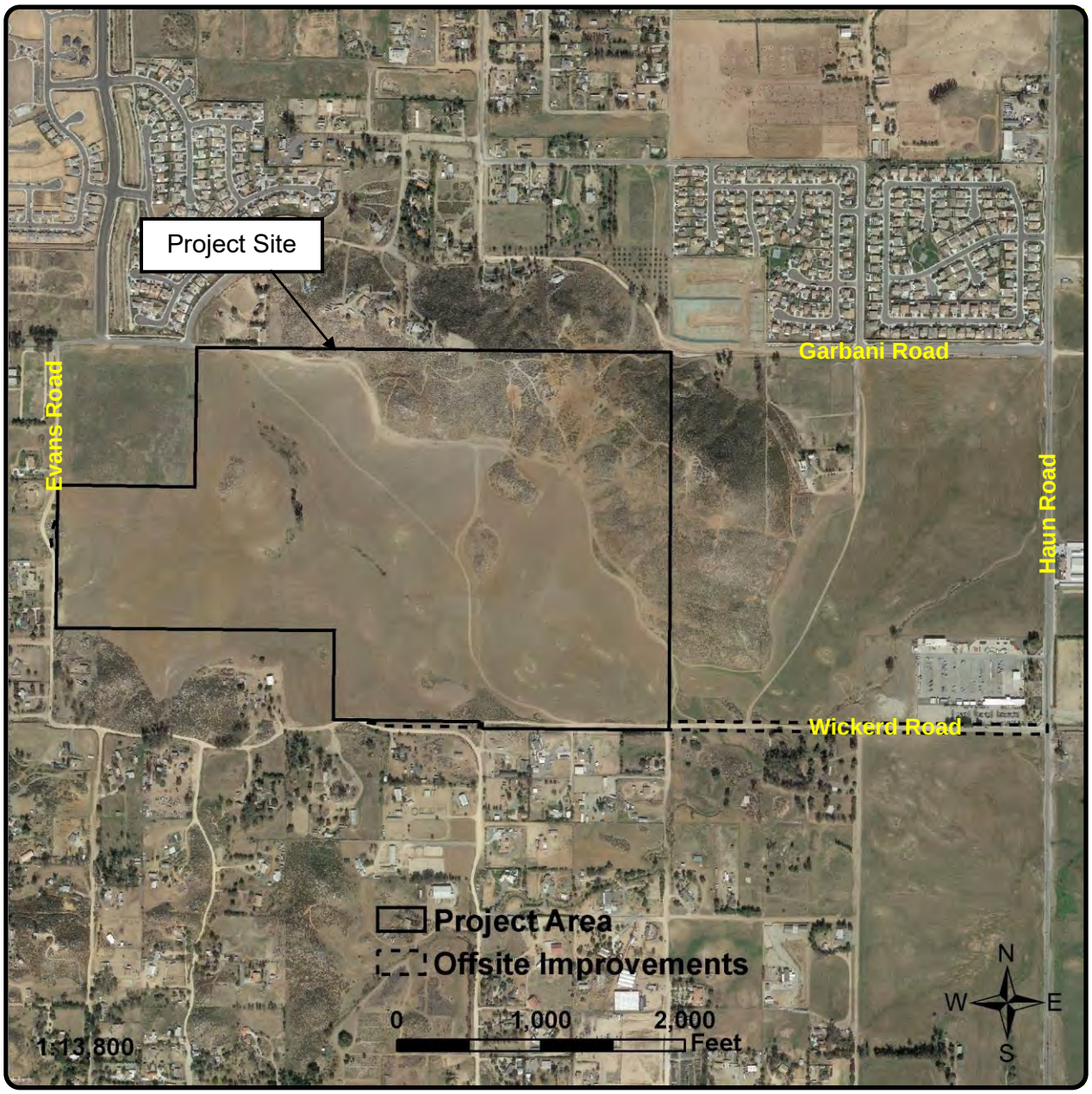
Figure 2

Project Location Map

(USGS Romoland 1979 quadrangle,
Sections 15 & 16, Township 6 South, Range 3 West)

Golden Meadows, TT 31194
City of Menifee, California



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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
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Figure 3a

Aerial Photograph
(Photo obtained from Google Earth, February 2018)

Golden Meadows, TT 31194
City of Menifee, California

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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

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Figure 3b

Development Plan
(Plan obtained from Hunsaker & Assoc. Irvine, Inc., 2021)

Golden Meadows, TT 31194
City of Menifee, California

1.3) Vegetation and Setting

A review of historical aerial images (NETRonline 2021, Google Earth 2021) finds that most areas of the site have been disturbed in association with agricultural uses since at least 1938. These areas are still under cultivation and do not support native habitat communities. Areas of California buckwheat scrub are present in the less disturbed areas on the property, mainly the slopes in the northeastern corner. Remnants of chamise chaparral are present along the southern site boundary.

An ephemeral drainage feature and mapped blue-line stream is present trending from the southwest/central to the northwest portion of the site, as well as various other jurisdictional features. Much of this area has been impacted by agricultural activities and invasive plants, but limited areas of disturbed and degraded riparian vegetation are present in association with this drainage. No vernal pools or ponding areas were observed onsite.

Land use adjacent to the site includes anthropogenic disturbances such as rural residential development, agricultural areas, unimproved roads, powerline easements, OHV activity, and trash dumping.

Two (2) unimproved roads are present on the property. The first is an unnamed dirt road that begins at the eastern terminus of Daniel Road (in the northwestern corner of the site) and exits at the southeastern corner of the site near the intersection of Wickerd Road and Ascot Way. The second is identified as Krubsack Road, which runs north-south through agricultural fields within the roughly west-central portion of the property and connects with Wickerd Road to the south and Daniel Road to the north. Many OHV trails are also present on the property, mainly in the northeastern corner. The 2021 survey found that earthen berms and rock piles had recently been placed on roads and trails to block entrance to the site.

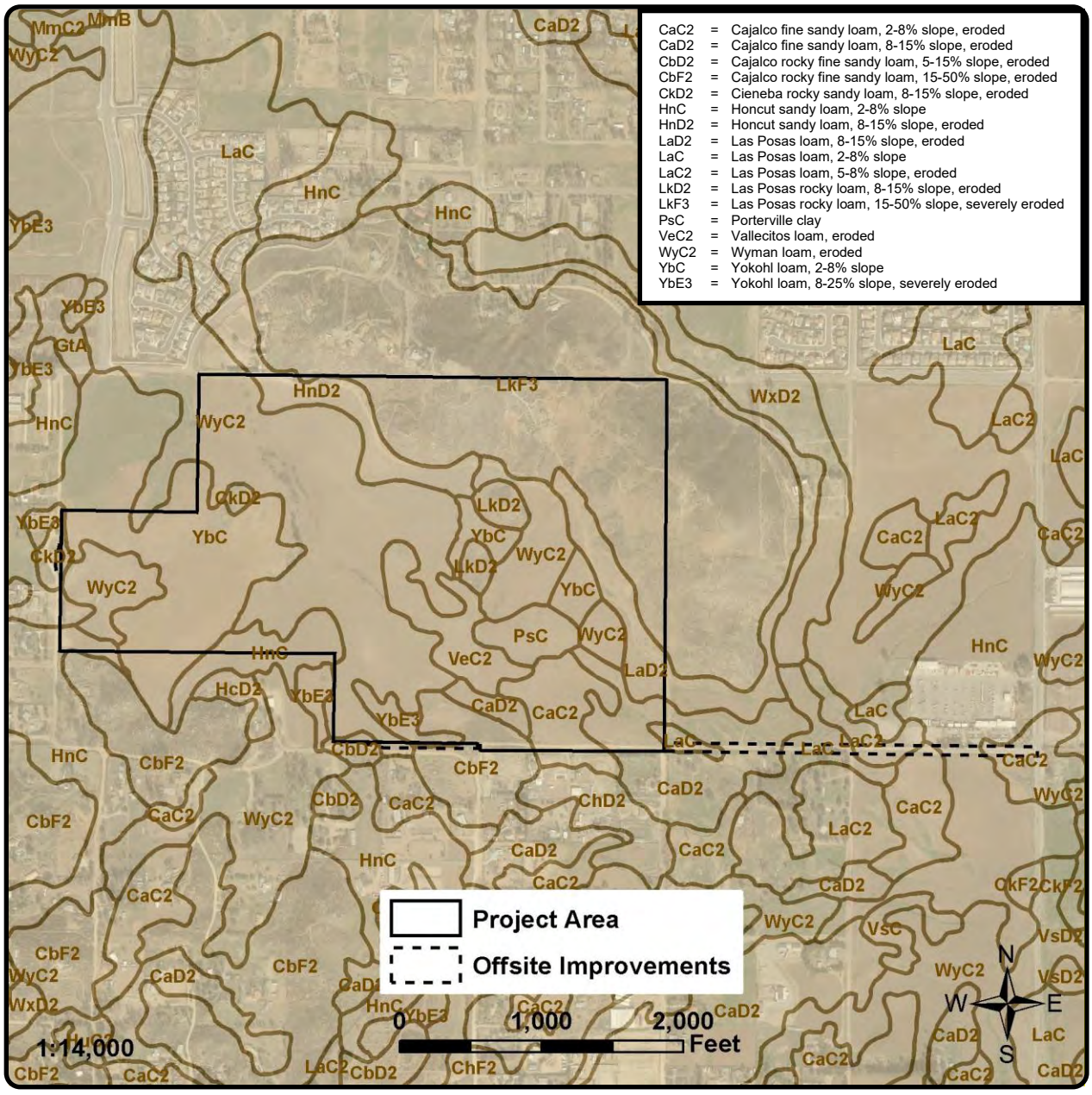
1.4) Soils and Topography

Soils on the Project site were mapped as Wyman loam (WyC2), Vallecitos loam (VeC2), Porterville clay (PsC), Yokohl loam (YbC and YbE3), Cajalco fine sandy loam (CaC2 and CaD2), Cajalco rocky fine sandy loam (CbF2), Honcut sandy loam (HnC and HnD2), Las Posas loam (LaD2), and Las Posas rocky loam (LkD2 and LkF3) (NRCS 2021) (Figure 4).

The most common soils mapped for the subject property are Wyman loam on the central and western portion of the site (in agricultural areas) and Las Posas rocky loams on vegetated

hillsides within the northern and eastern portions of the site. Clay soils are relatively uncommon on the site, but Porterville clay is mapped as present near the southeastern portion of the property. Soils observed onsite range from mostly sandy-loamy within the agricultural areas to rocky loamy on the vegetated hillsides. Cryptobiotic crusts are present, but only within less disturbed portions of the site.

Topographically, much of the site is relatively flat and contains open land with low-relief rocky outcrops. Gently to steeply sloping hills and ridgelines are present within the northeastern portion of the property. The site has a combined maximum vertical relief of roughly 220 feet (67 meters) between the highest and lowest points on the property, with elevation ranging from approximately 1,500 to 1,720 feet (457 to 524 meters) above mean sea level (AMSL).



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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
December 2021

Figure 4

Soils Map

(Photo obtained from Google Earth, February 2016, USDA Nat. Res. Cons. Serv. SSURGO Data)

Golden Meadows, TT 31194
City of Menifee, California

2.0) METHODS AND PERSONNEL

2.1) Literature Review

Certain plants and animals have been listed as threatened or endangered under state or federal Endangered Species Acts. Other species have not been formally listed, but declining populations or habitat availability are reasons for concern regarding their long-term viability. These species are included in lists compiled by resource management agencies or conservation organizations. In this report, the term "listed" refers to all species that are listed, or candidates for listing, as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or California Department of Fish and Wildlife (CDFW). "Special status species" refers to all species included in one or more compendia of rare species, but not listed as threatened or endangered by USFWS or CDFW.

Pertinent literature was reviewed to identify local occurrences and habitat requirements of special status species and communities occurring in the region. Literature reviewed included compendia provided by resource agencies (CDFW 2021a, 2021b), a search of the California Natural Diversity Database (CNDDB; CDFW 2021c) and California Native Plant Society Inventory of Rare and Endangered Plants (CNPS 2021) for the Project topographic quadrangle (Romoland) and adjacent quadrangles (Steele Peak, Perris, Lakeview, Lake Elsinore, Winchester, Wildomar, Murrieta, and Bachelor Mountain), and a search of USFWS Information for Planning and Consultation (IPaC; USFWS 2021a) for the Project site. Reports of previous surveys completed for the site (L&L 2003-2019) were also reviewed. Information from past surveys is summarized and included in this report as appropriate.

Potentials for occurrence of plant and wildlife species were evaluated and classified as either absent, not expected, low, moderate, high, or occurs. These classifications are based on the presence and quality of habitat, geographic and elevation range of species, proximity to a known occurrence of a species obtained from CNDDB or other reliable data, and field observations. Classifications for individual species may be modified based on biologists' experience and expert opinion.

Scientific names of plants follow Baldwin et al. (2012) with updates from the online Jepson eFlora (Jepson 2021). Scientific names of animals follow Stebbins (1985), Jameson and Peeters (1988), Cornell (2021), and Arnett (2000), with updates from academic sources. Current conservation status of plant and wildlife species determined from CDFW (2021a,

2021b). Vegetation community classifications follow Sawyer et al. (2009) with updates from CDFW (2020). State ranks (S ranks) for vegetation communities are from CDFW (2020). Other sources consulted for information regarding biological resources include Brown (1994), Recon (1985), Schoenherr (1990), and Small (1994).

In this report, the "Project site" or "site" includes all of the Project parcels (±204.65 acres) plus offsite impact areas (±4.68 acres) for a total of ±209.33 acres surveyed. Acreages are based on GIS calculations.

2.2) General Biological and Botanical Survey Methods

L&L biologist Guy Bruyea visited the Project site from May through November of 2021 to conduct general biological and botanical surveys (Table 1).

Table 1. General Biological and Botanical Survey Dates and Weather Conditions

Date	Time	Weather	Wind (mph)
05.21.2021	0545-0845	Clear, 50-56º F	1-6
05.21.2021	1700-1930	Clear, 62-67º F	2-5
05.25.2021	0530-0830	Clear, 57-65º F	0-1
05.31.2021	0530-0830	Marine layer/Clear, 61-73º F	0-4
05.31.2021	1700-1930	Clear, 74-82º F	2-4
06.05.2021	0600-1100	Clear, 74-83º F	0-2
06.07.2021	0600-1000	Clear, 58-67º F	0-3
07.06.2021	0600-0900	Clear, 66-75º F	0-2
07.11.2021	0600-0830	Partly Cloudy, 73-81º F	1-2
08.01.2021	0630-1030	Clear, 76-87º F	1-4
11.08.2021	0800-1200	Clear, 66-75º F	0-3
11.09.2021	0900-1300	Clear, 70-79º F	1-5

A total of about 40.5 person-hours were spent onsite during surveys in 2021. All habitat types onsite were visited on foot. The site was surveyed by conducting a series of transects across the subject property where possible, stopping periodically for observations and notations. A general habitat map and field notes were completed at the time of the survey. All field surveys were conducted during daylight hours. Digital photographs were taken to record the condition of the site during the present survey.

The methodology used is consistent with recommendations by the California Native Plant Society (CNPS 2001), CDFW (2018, 2000), and USFWS (2000). All plant species observed were identified in the field or collected for later identification or confirmation. All species were recorded in field notes and the locations of special status species were documented using GPS. Plants of uncertain identity were collected and subsequently identified from keys, descriptions,

and illustrations in Baldwin (2012), Abrams (1923, 1944, and 1951), Abrams and Ferris (1960), Munz (1974), and Parker (1999).

Vegetation community mapping of the site was also verified in 2021. The vegetation mapping from the 2018 biological survey report (L&L 2018a) was used as a basis and verified through field observations. Vegetation community classification is consistent with the California Natural Community List (CDFW 2020) and Sawyer et al. (2009).

2.3) Burrowing Owl Survey Methods

Protocol breeding season burrowing owl surveys were conducted by Mr. Bruyea concurrently with a portion of the general biological and botanical surveys (Table 2).

Table 2. Burrowing Owl Survey Dates and Weather Conditions

Date	Time	Sunrise*	Sunset*	Weather	Wind (mph)
05.21.2021	0545-0845	0547	--	Clear, 50-56º F	1-6
05.21.2021	1700-1930	--	1952	Clear, 62-67º F	2-5
05.31.2021	0530-0830	0542	--	Marine layer/Clear, 61-73º F	0-4
05.31.2021	1700-1930	--	1958	Clear, 74-82º F	2-4
06.05.2021	0600-1100	0541	--	Clear, 74-83º F	0-2
06.07.2021	0600-1000	0541	--	Clear, 58-67º F	0-3
07.06.2021	0600-0900	0547	--	Clear, 66-75º F	0-2
07.11.2021	0600-0830	0550	--	Partly Cloudy, 73-81º F	1-2

*sunrise/sunset times from timeanddate.com

A total of about 25.5 person-hours were spent during burrowing owl surveys in 2021. The site was examined for suitable burrow sites and for signs of occupation by burrowing owl, including pellets, feathers, whitewash, prey remains, and eggshell fragments, as well as individual owls. A search for potentially suitable burrows within dirt, wood, and rock debris piles, artificially created berms, and other locations was conducted during the surveys. The surveys were concentrated in areas typically associated with burrowing owl habitat, including open areas onsite and areas where California ground squirrel activity (i.e., suitable burrows) was expected. An additional 150-meter (500-foot) buffer area surrounding the site was visually inspected, where possible, in areas identified as potential burrowing owl habitat (Figure 5). Any developed areas were visually surveyed with binoculars due to trespassing concerns on private property.

Transects were walked throughout the property where suitable habitat is present. Coupled with binocular surveys of any restricted areas, this allowed for complete visual ground coverage of the survey area. Distance between transects was approximately 15 to 20 meters.

Per MSHCP protocol for burrowing owl surveys (RCA 2006), surveys should be conducted during weather that is conducive to observing owls outside their burrows and detecting burrowing owl sign. Surveys will not be accepted if they are conducted during rain, high winds (>20 mph), dense fog, or temperatures over 90°F. Surveys should be conducted in the morning one hour before sunrise to two hours after sunrise or in the early evening two (2) hours before sunset to one (1) hour after sunset. Surveys were conducted during appropriate hours and weather conditions (Table 2).

2.4) Nesting Raptor Survey Methods

Concurrently with the burrowing owl survey, the site was examined to determine the presence/absence of nesting raptors on the property, in particular white-tailed kite. This survey primarily focused on examining trees onsite and within 500 feet of the Project site for evidence of raptor nesting.

2.5) Riparian Bird Habitat Assessment Methods

A habitat assessment for riparian bird species least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo was conducted by John Konecny of Konecny Biological Services. Mr. Konecny holds USFWS Section 10(a) permit TE837308-7 for southwestern willow flycatcher.

The habitat assessment was conducted on September 29, 2021 and focused on the riparian vegetation on the site. Weather conditions during the survey were mild with little wind and scattered overcast. No call prompting of any species was conducted.

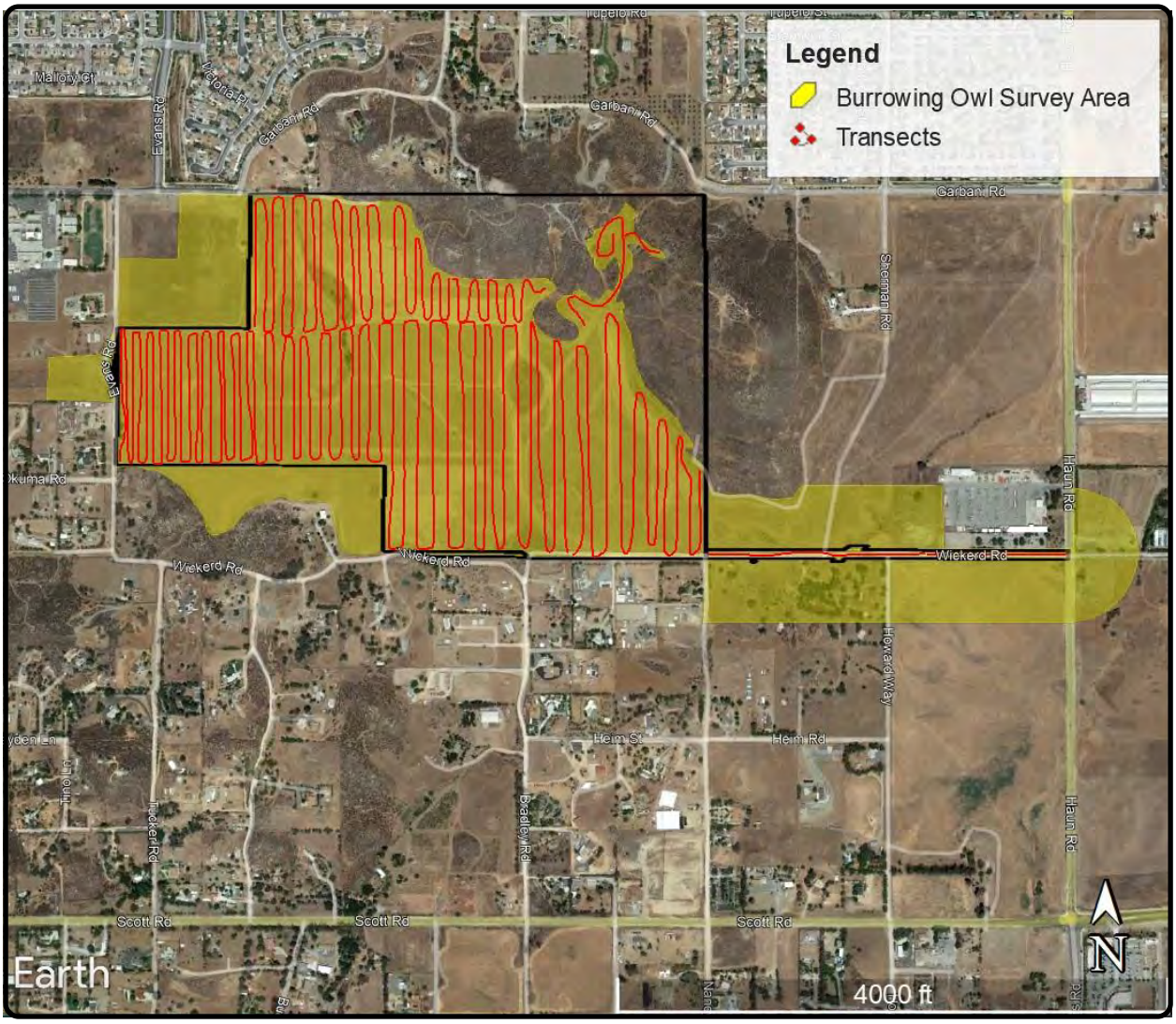

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Figure 5

Burrowing Owl Survey Area
(Photo obtained from Google Earth, August 2021)

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City of Menifee, California

3.0) RESULTS

3.1) Literature Review Results

3.1.1) MSHCP Requirements

The site is located within the area covered by the MSHCP but is not within the Criteria Area. There is one area of Public/Quasi-Public (PQP) Conserved Lands approximately 0.68 miles north-northeast of the site. This PQP area is identified as Ringing Rock Archaeological Site under the management of the Riverside County Parks and Open Space District. Other than the Ringing Rock Site, there are no other PQP or MSHCP Conserved Lands within a mile of the site. The site is not within or near any MSHCP Core Areas or Linkages (Figure 6).

Surveys required by the MSHCP are a habitat assessment to address riparian/riverine and vernal pool habitats and associated species and burrowing owl (RCA 2021). If suitable habitat is present, focused surveys are required.

The MSHCP mapped vegetation layer (1994 baseline) depicts the site as largely agricultural land with areas of coastal sage scrub, grassland, and chaparral. No riparian habitat or Riversidean alluvial fan sage scrub is mapped on the parcel in the 1994 baseline (RCA 2021).

3.1.2) Precipitation

Precipitation data was obtained from the Clark, Sage, and Cranston Remote Automated Weather Stations (RAWS) (WRCC 2021). The Clark RAWS is located about 16.8 miles north-northwest of the Project site at an elevation of 1,720 feet; Sage RAWS is about 14.7 miles east-southeast of the site at an elevation of 1,516 feet; Cranston RAWS is about 21.0 miles east-northeast of the site at an elevation of 1,950 feet (WRCC 2021).

Total precipitation recorded by the Clark, Sage, and Cranston RAWS for the 2021 water year[1] was 4.96, 6.19, and 6.75 inches, respectively. Average annual precipitation for the Project area is 10 to 15 inches (WRCC 2018). Precipitation data is provided in Appendix C.

[1] A water year is October through September. For example, the 2021 water year is October 2020 through September 2021.

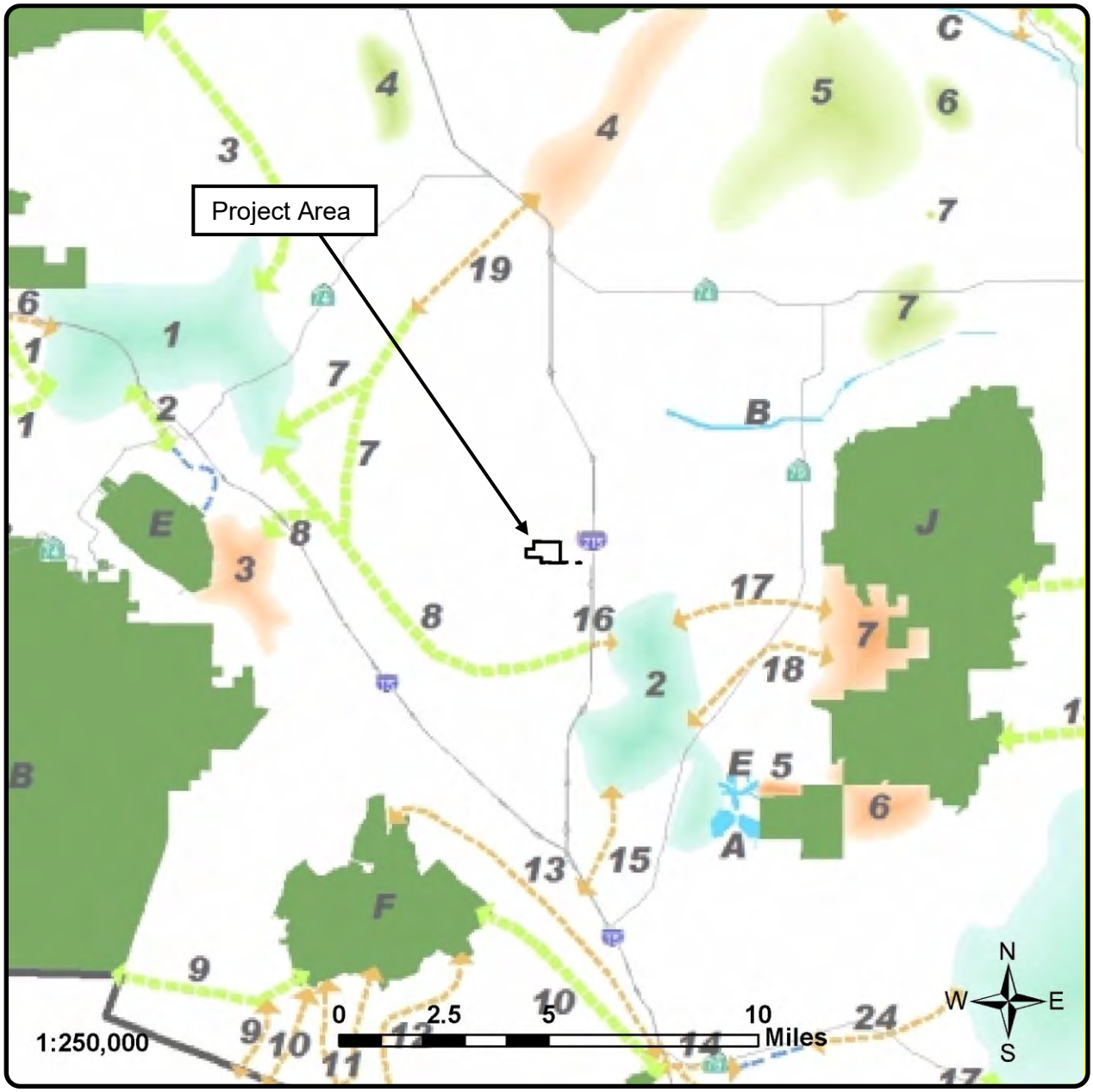

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Figure 6

MSHCP Cores and Linkages
(Riverside County MSHCP)

Golden Meadows, TT 31194
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3.1.3) Previous Surveys

L&L reviewed the results of previous biological surveys of the site, which included a general biological survey and a jurisdictional delineation in 2003 (L&L 2003a, 2003b), spring botanical survey and focused surveys for Quino checkerspot butterfly and coastal California gnatcatcher in 2004 (L&L 2004a, 2004b, 2004c), burrowing owl survey, habitat assessment for riparian birds, and updated jurisdictional delineation in 2005 (L&L 2005a, 2005b, 2005c), burrowing owl survey, focused surveys for least Bell's vireo and southwestern willow flycatcher, and a habitat assessment for yellow-billed cuckoo in 2006 (L&L 2006a, 2006b), burrowing owl survey in 2007 (L&L 2007), surveys for special status plants, burrowing owl, and updated jurisdictional delineation in 2011 (L&L 2011), habitat assessment and burrowing owl survey in 2013 (L&L 2013), general biological and botanical survey in 2017 (L&L 2017), burrowing owl and nesting raptor surveys and updated jurisdictional delineation in 2018 (L&L 2018a, 2018b), and burrowing owl surveys and an updated jurisdictional delineation in 2019 (L&L 2019a, 2019b). Previous survey results are summarized and incorporated into this report as appropriate.

3.1.4) 2006 Environmental Impact Report

The 2006 Final Environmental Impact Report (EIR) for the Project (T&B 2006) includes the following mitigation measures for impacts to biological resources:

> 4.3-1 TTM No. 31194, Lot #503 (approximately 39.0 acres in the northeastern portion of the property) shall be preserved as open space and shall be covered by a conservation easement or other mechanism to ensure permanent preservation, with allowance for required maintenance of fuel modification zones. The conservation easement area shall be shown on the Final Map.
>
> 4.3-2 Thirty days prior to grading, a qualified biologist shall make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report to be reviewed and accepted by the County of Riverside. If the species is determined to be present, and the MSHCP's stated objectives 1 – 4 for burrowing owl have not yet been met, mitigation shall be required in compliance with the MSHCP, Appendix E which states:
>
> > a. If the site contains or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and surrounding area supports

less than 3 pairs of burrowing owls, then the on-site burrowing owls shall be passively or actively relocated following accepted protocols.

b. If the site (including adjacent areas) supports 3 or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs shall be conserved on-site.

4.3-3 Prior to issuance of grading permits, the applicant shall be required to pay Local Development Mitigation Fees (per County Ordinance No. 4.62.070) for implementation of the MSHCP.

4.3-4 Prior to issuance of grading permits, the applicant shall pay fees in accordance with the USFWS-approved HCP, to mitigate the project's potentially significant impacts to the Stephens' kangaroo rat.

4.3-5 If construction activities occur between February 1 and August 31 and within 150 feet of suitable nesting locations, a focused raptor survey will be required prior to issuance of grading permits. If active nests are located within the portion of the site to be disturbed or within 150 feet of the area to be disturbed, measures shall be initiated to avoid any impacts to nesting raptors. Measures to avoid impacts will include identifying the location and creating a buffer zone around the tree within which impacts will be avoided until the juveniles have fledged.

a. The white-tailed kite is "fully-protected" by the California Department of Fish and Game. If this species is documented as nesting on the project site during the raptor survey, or it is determined this species will be significantly impacted by development a 2080 permit for "take" shall be required from the CDFG.

4.3-6 Prior to the issuance of grading permits, the applicant shall submit documentation to the County of Riverside verifying that the necessary permits required by the U.S. Army Corps of Engineers (ACOE), California Department of Fish and Game (CDFG) and Regional Water Quality Control Board (RWQCB) have been obtained. The ACOE has a no net loss policy which requires that any unavoidable impacts to wetland values and functions be replaced. In addition, the RWQCB will add restrictions to control runoff from the site, require on the site treatment of runoff to improve water quality, and impose Best Management Practices on the construction. It is anticipated that the following measures

or similar measures as approved by the ACOE, CDFG, and RWQCB would reduce impacts to ACOE and CDFG jurisdictional areas to a level less than significant:

a. On or off-site replacement of ACOE jurisdictional waters and wetlands at a ratio no less than 1:1;

b. On or off-site replacement of CDFG jurisdictional streambed and associated riparian habitat at a ratio no less than 1:1; and/or

c. Incorporation of design features into the proposed project that will avoid biological impacts to off-site blue-line streams that ultimately end up in the Railroad Canyon Reservoir (Canyon Lake).

4.3-7 Individual lot fencing shall be used to restrict access to the on-site wetland areas. Back yard gates from individual residential lots that open onto the wetland area shall be prohibited. Fencing locations and materials shall be shown on the Final Map and approved by the County's Environmental Programs Department (EPD) prior to issuance of building permits. Required fencing shall be installed prior to issuance of occupancy permits.

4.3-8 Night lighting during and after project construction shall be directed away from onsite wetland areas and, except for safety and other requirements, lighting shall be limited from the boundaries of onsite wetland areas. In the event that lighting in an area adjacent to the wetland area is necessary, a shield shall be incorporated in project designs to ensure ambient lighting in the wetland area is not increased. Lighting plans shall be approved by the County prior to issuance of building permits. Lighting restrictions and the reasons for such restrictions shall be included in the project's CC&Rs.

4.3-9 The landscape plans for the project in areas adjacent or tributary to wetland areas shall not include those species listed in the MSHCP as "Plants That Should Be Avoided Adjacent to The MSHCP Conservation Area." The County of Riverside Planning Department shall review and approve all plant material for the project, prior to issuance of building permits. Information regarding the importance of avoiding the listed plants, even in front and backyard landscaping, shall be included in sales literature distributed to homeowners. The list of restricted plant materials and the reasons for such restrictions shall be listed in the project's CC&Rs.

3.2) Vegetation Communities

Much of the property has been disturbed by current and historical cultivation and past sheep grazing and does not support native habitat. Less disturbed areas are present, primarily in the northeastern portions of the site, with a mixture of disturbed and relatively undisturbed California buckwheat scrub and chamise chaparral. Sparse riparian vegetation and trees are found along the blue-line stream in the northwestern/central portion of the site (Figure 7).

The agricultural fields are dry farmed for wheat. Evidence of widespread sheep grazing was observed throughout all areas of the site in 2013. Hillsides containing California buckwheat scrub along the farmland edges, especially to the north and east, had been severely damaged by sheep grazing. Very few annuals remained (none in some areas) and many of the perennials had been stripped of vegetation and/or trampled. No evidence of current sheep grazing was observed during surveys in 2017, 2018, 2019, and 2021 and regrowth of native annuals and perennials was observed in the buckwheat scrub areas.

Table 3. Vegetation Communities Present

Vegetation Community	**Area Present (acres)**		
	Onsite	**Offsite**	**Total**
California Buckwheat Scrub	41.69	0	41.69
California Buckwheat Scrub/Ruderal	2.52	0	2.52
Chamise Chaparral	2.05	0.18	2.23
Arroyo Willow Thickets and Mulefat Thickets	1.31	0.05	1.36
Agriculture and Disturbed/Ruderal	157.08	4.45	161.53
Total	**204.65**	**4.68**	**209.33**

Table 4. Vegetation Community Impacts

Vegetation Community	**Area Impacted (acres)***		
	Onsite	**Offsite**	**Total**
California Buckwheat Scrub	18.49**	0	18.49**
California Buckwheat Scrub/Ruderal	2.52	0	2.52
Chamise Chaparral	2.05	0.18	2.23
Arroyo Willow Thickets and Mulefat Thickets	1.31	0.05	1.36
Agriculture and Disturbed/Ruderal	154.30	4.45	158.75
Total	**178.67**	**4.68**	**183.35**

*Any discrepancy in totals due to rounding error. **Includes the water tank site. The water tank site is a separate project covered under a separate CEQA process by EMWD and not a part of the Golden Meadows Project.

3.2.1) California Buckwheat Scrub

In previous reports, this vegetation community was referred to by the older name of Riversidean sage scrub (Holland Element Code 32700). Under the more recent Sawyer et al. (2009) classification, this type of coastal scrub is best classified as California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance). CDFW ranks this community as S5 (secure – common, widespread, and abundant) and it is not considered sensitive.

California buckwheat scrub is present on the northeastern portion of the site on south, west, and east-facing slopes containing numerous rocky outcrops. Native shrubs and other conspicuous plants commonly observed in these areas include California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemisia californica*), and white sage (*Salvia apiana*). Other conspicuous plants include brittlebush (*Encelia farinosa*), yellow bush-penstemon (*Keckiella antirrhinoides*), wishbone bush (*Mirabilis laevis* var. *crassifolia*), sweetbush (*Bebbia juncea*), and black sage (*Salvia mellifera*). Annuals are also abundant in this community and include natives such as wreath plant (*Stephanomeria virgata*) and western sunflower (*Helianthus annuus*) and non-natives such as shortpod mustard (*Hirschfeldia incana*), red brome (*Bromus rubens*), slender wild oat (*Avena barbata*), and Mediterranean grass (*Schismus barbatus*).

Open patches can be found throughout portions of the buckwheat scrub onsite and contain a mixture of native and non-native annuals. Natives include popcorn flower (*Plagiobothrys* species), large flower rancher's fiddleneck (*Amsinckia intermedia*), common cryptantha (*Cryptantha intermedia*), evening primrose (*Camissonia* species), wild carrot (*Daucus pusillus*), slender tarweed (*Deinandra fasciculata*), and phacelia (*Phacelia* species). Other plants observed include chia (*Salvia columbariae*), perezia (*Acourtia microcephala*), hooked navarretia (*Navarretia hamata*), sapphire woollystar (*Eriastrum sapphirinum*), and fringed spineflower (*Chorizanthe fimbriata*).

3.2.2) Chamise Chaparral

In previous reports, this vegetation community was referred to by the older name of northern mixed chaparral (Holland Element Code 37130). Under the more recent Sawyer et al. (2009) classification, this vegetation community is best classified as chamise chaparral (*Adenostoma fasciculatum* Shrubland Alliance) or chamise–black sage chaparral (*Adenostoma fasciculatum*–*Salvia mellifera* Shrubland Alliance). CDFW ranks chamise chaparral as S5 (secure – common,

widespread, and abundant) and chamise-black sage chaparral at S4 (apparently secure – uncommon but not rare). The chaparral on the site is not considered sensitive.

Common species found in the chaparral areas onsite are chamise (*Adenostoma fasciculatum*), black sage, and other perennials. A poorly developed understory is usually present in association with chaparral and is characteristic of this vegetation community on the site.

Only small patches of remnant chaparral were observed on the site along the southern boundary. The survey in November 2021 found that a portion of the chamise chaparral on the site had been mowed to the ground.

3.2.3) Arroyo Willow Thickets and Mulefat Thickets

In previous reports, the riparian vegetation onsite was referred to by the older names of southern arroyo willow riparian (Holland Element Code 61320), mulefat scrub (Holland Element Code 63310), and disturbed wetland (Holland Element Code 11200). Under the more recent Sawyer et al. (2009) classification, this vegetation community is best classified as arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance) and mulefat thickets (*Baccharis salicifolia* Shrubland Alliance). CDFW ranks arroyo willow thickets as S4 (apparently secure – uncommon but not rare); however, it is considered sensitive. Mulefat thickets are ranked as S5 (secure – common, widespread, and abundant) and not considered sensitive.

Arroyo willow thickets and mulefat thickets are dependent on the presence of at least periodic surface or subsurface water. The northwestern portion of the site contains a degraded blue-line stream sparsely inhabited by arroyo willow (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), or a mix of the two. A single Fremont cottonwood tree (*Populus fremontii* ssp. *fremontii*), five southern California black walnut trees (*Juglans californica*), black willow (*Salix gooddingii*), and scattered blue elderberry (*Sambucus nigra* ssp. *cerulea*) and non-native tamarisks (*Tamarix* species) are also present. The understory is dominated by native and non-native annuals, including (but not limited to) shortpod mustard, western sunflower, large-flowered rancher's fiddleneck, Spanish clover (*Acmispon americanus*), wild radish (*Raphanus sativus*), mayweed (*Anthemis cotula*), prickly lettuce (*Lactuca serriola*), and non-native grasses, including wheat (*Triticum aestivum*) and oat (*Avena* species).

Surface water was not observed within any of the onsite drainage features during the surveys. Over the course of surveys since 2003, it has been noted that the density and health of riparian

shrubs and trees appears to be declining. Over time, some areas of the streambed and gaps in riparian vegetation have been incorporated into the surrounding agricultural fields.

3.2.4) Agriculture and Disturbed/Ruderal

In previous reports, agricultural fields and disturbed/ruderal areas onsite were referred to by the older designations of Holland Element Codes 18300 and 11300. Agriculture is not included under the more recent Sawyer et al. (2009) classification. Disturbed/ruderal areas that are strongly dominated by annual non-natives may be classified as semi-natural stands, such as *Brassica* (*nigra*) and Other Mustards Semi-natural Herbaceous Stands or *Bromus rubens*—*Schismus barbatus* Semi-natural Herbaceous Stands. These are not considered sensitive vegetation communities.

The majority of the site is under cultivation and consists of dry-farmed wheat crops. Invasive plants are found within farmed portions of the site, and include lamb's quarters (*Chenopodium murale*), calabazilla (*Cucurbita foetidissima*), and knotweed (*Polygonum aviculare*).

Disturbed habitat includes unvegetated areas (such as roads) and areas that contain mostly non-native plant species, including ornamentals and ruderal invasives. Some non-native and weedy species have invaded these areas, including short-pod mustard, red brome, redstem filaree (*Erodium cicutarium*), and various non-native grasses. Other non-native plant species observed in these areas include horehound (*Marrubium vulgare*), Russian thistle (*Salsola tragus*), and tumbling pigweed (*Amaranthus albus*).

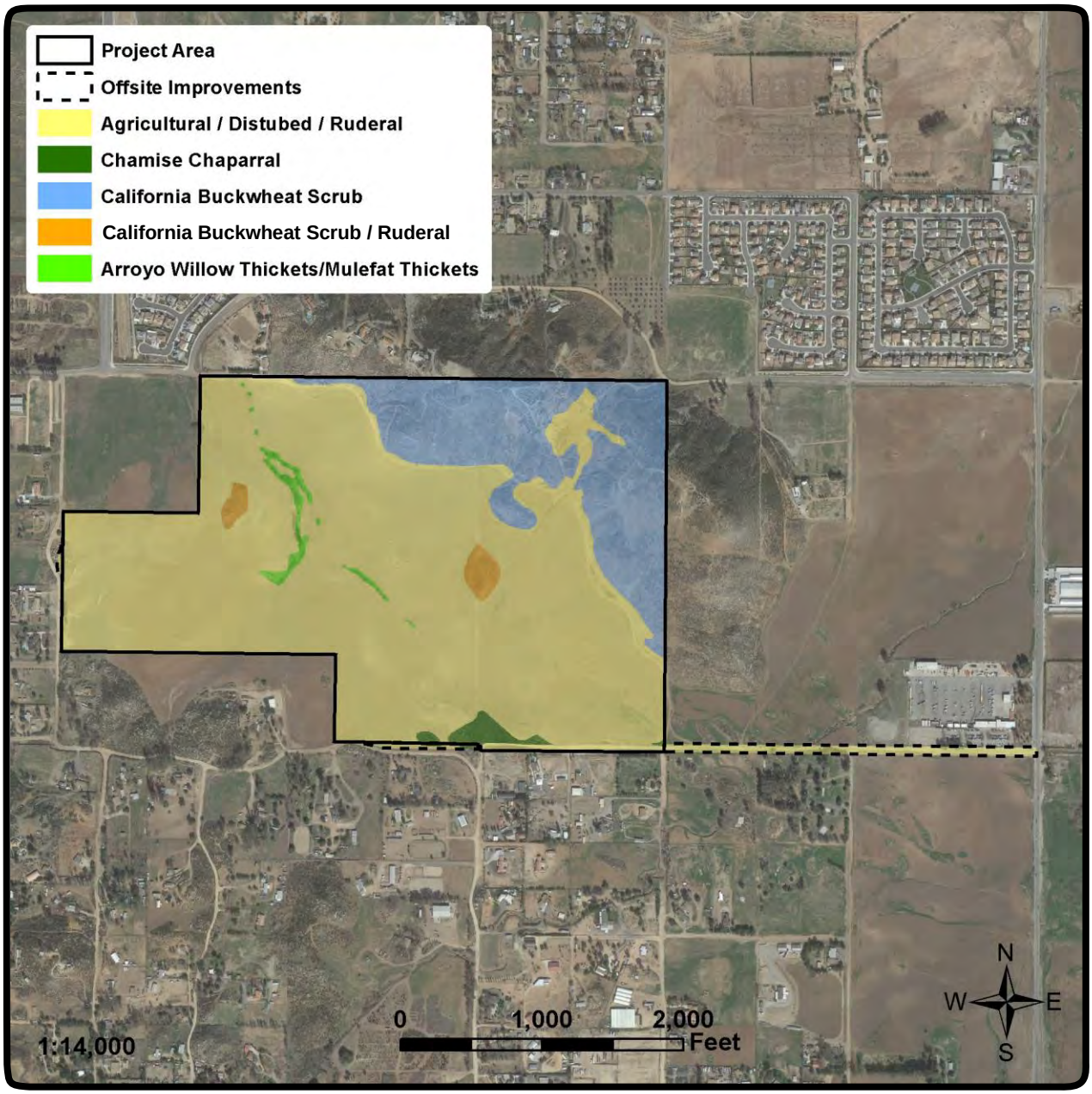

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Figure 7

Vegetation Community Map
(Photo obtained from Google Earth, February 2016)

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3.3) Plant Species

A total of 127 plant species were observed onsite during biological surveys conducted by L&L from 2003 through 2021. Of the 127 plant species present, 46 (36 percent) are non-natives. A list of all plant species identified onsite during previous and current surveys is included in Appendix A.

No state or federally listed plants were observed during surveys and the Project site is not within USFWS designated critical habitat for any listed plant species. Two special status plant species were observed on the site during surveys, long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*) and southern California black walnut (*Juglans californica*). Details of special status plant observations are provided in Table 5 and locations are mapped on Figure 8.

Table 5. Special Status Plant Species Observations

Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
Long-spined spineflower *Chorizanthe polygonoides var. longispina*	05.12.2017	33.655304, -117.187238	2	~1600
Southern California black walnut *Juglans californica*	09.22.2005 11.08.2021	33.653919, -117.192902	1	1517
	09.22.2005 11.08.2021	33.653955, -117.192924	1	1518
	11.08.2021	33.654018, -117.193226	1	1519
	11.08.2021	33.653468, -117.192879	1	1517
	11.08.2021	33.652603, -117.192823	1	1522

Long-spined spineflower is an annual herb in the Polygonaceae (Buckwheat) family. It is found in chaparral, coastal scrub, meadows and seeps, valley and foothill grasslands, and vernal pools at 100 to 5,020 feet elevation. It flowers from April through July. This species is found in Riverside, Orange, and San Diego Counties and Baja California, Mexico (CNPS 2021).

This species is not state or federally listed as threatened or endangered. It has a California Rare Plant Rank (CRPR) of 1B.2 (rare or endangered in California and elsewhere, moderately threatened in California). It is a covered species under the MSHCP and considered adequately conserved.

Long-spined spineflower was observed on the site in 2017. Two (2) plants were observed on clay soils within California buckwheat scrub in the northeast portion of the site along an east-west ridgeline. This area has been impacted by OHV use and the species has not been observed during subsequent surveys. Long-spined spineflower has also been documented by the CNDDB (Element Occurrence #57) on the east-central portion of the site. This record is from 2004 and estimates at least 100,000 plants on five acres of the site. It was not observed in this location during L&L surveys.

Southern California black walnut is a deciduous tree in the Juglandaceae (Walnut) family. It is found in chaparral, cismontane woodland, coastal scrub, and riparian woodland at 165 to 2,955 feet elevation. It is endemic to California and found in portions of southern, central, and northern California (CNPS 2021).

This species is not state or federally listed as threatened or endangered. It has a CRPR of 4.2 (limited distribution, moderately threatened in California). It is a covered species under the MSHCP and considered adequately conserved.

Five (5) southern California black walnut trees were observed in the riparian area in the central portion of the site. Representative photos are provided in Appendix D.

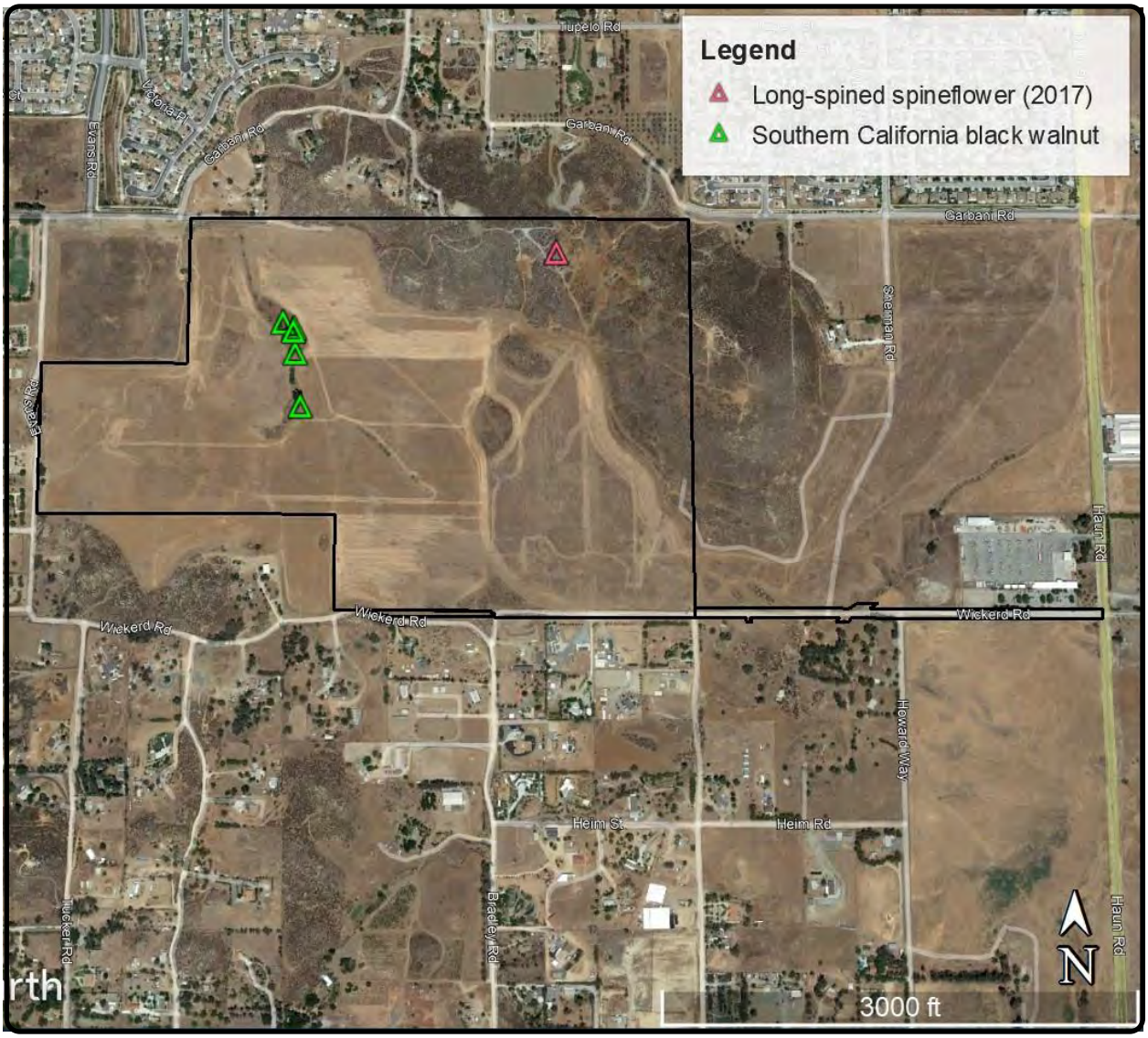
Three (3) additional special status plant species have a low to moderate or moderate potential to occur on the Project site but not been observed during surveys (see Appendix B). These species are:

- smooth tarplant (*Centromadia pungens ssp. laevis*; CRPR 1B.1 [rare or endangered in California and elsewhere, seriously threatened in California]),
- Parry's spineflower (*Chorizanthe parryi var. parryi*; CRPR 1B.1), and
- small-flowered morning-glory (*Convolvulus simulans*; CRPR 4.2).

These three (3) species are all covered under the MSHCP and considered adequately conserved.

3.3.1) Trees

There is a single immature coast live oak tree (*Quercus agrifolia*) present on the site within the riparian area. Other native trees on the site are blue elderberry, southern California black walnut, Fremont cottonwood, arroyo willow, and black willow. Non-native and escaped ornamental trees on the site include Peruvian pepper tree (*Schinus molle*), eucalyptus, tree tobacco (*Nicotiana glauca*), and tamarisk. The City may regulate removal or replacement of trees and a tree survey may be required.



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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

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Figure 8

Special Status Plant Observations

(Photo obtained from Google Earth, August 2021)

Golden Meadows, TT 31194
City of Menifee, California

3.4) Wildlife Species

A total of 85 vertebrate wildlife species, plus domestic dog, have been detected during L&L's biological surveys of the site from 2003 through 2021. An additional 15 common butterfly species were observed (during Quino checkerspot butterfly surveys in 2004) but this does not represent a comprehensive list of insects present. A list of all wildlife species identified onsite is provided in Appendix A. Details of listed and special status species observations are provided in Table 6 and observations are mapped on Figure 9. CNDDB forms for 2021 observations are included in Appendix E.

Table 6. Listed and Special Status Wildlife Species Observations

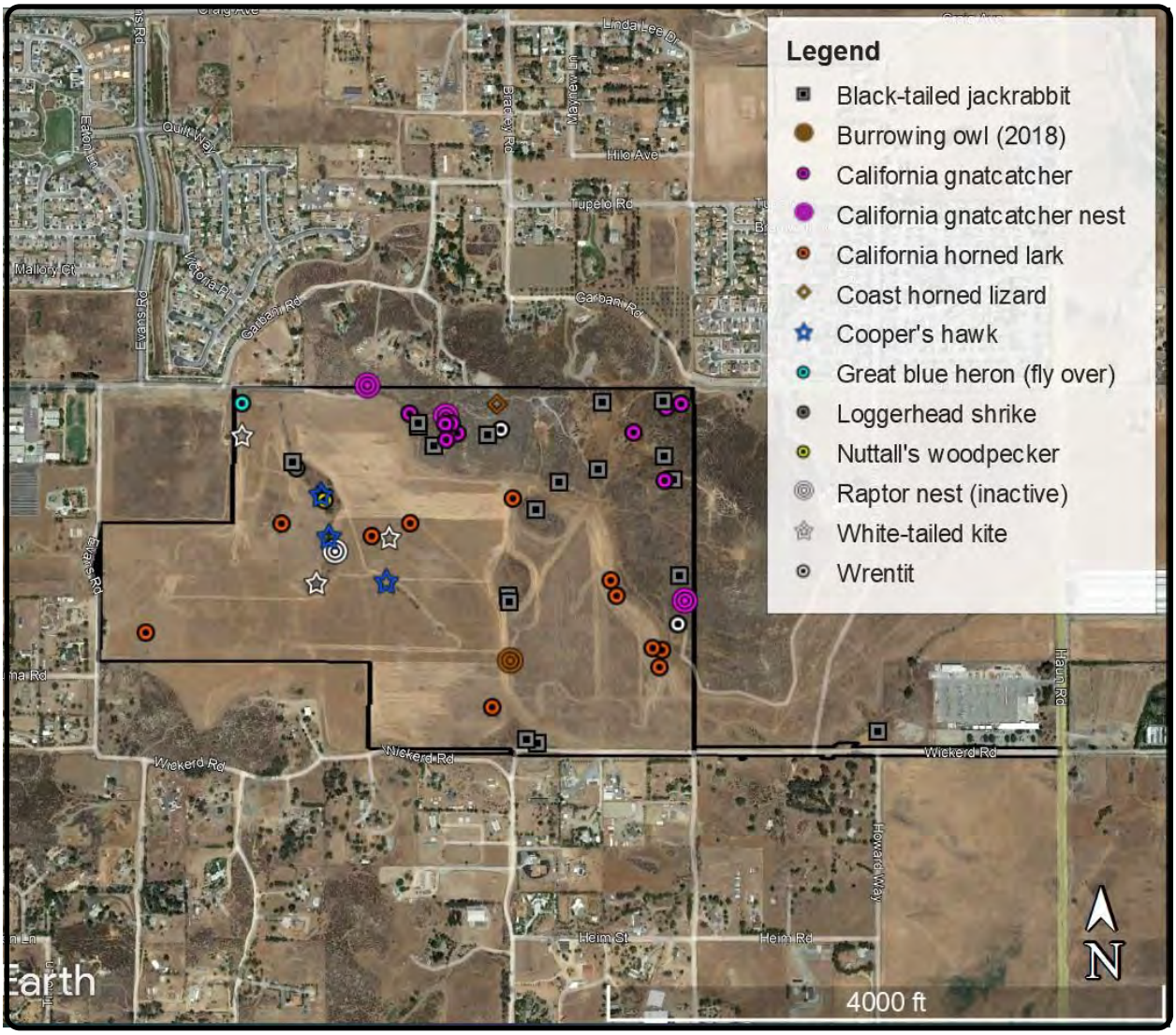
Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
Coast horned lizard *Phrynosoma blainvillii*	04.26.2011	33.655640, -117.188980	1	1723
	2004*	--	--	--
Orange-throated whiptail *Aspidoscelis hyperythra*	2004*	--	--	--
Coastal (western) whiptail *Aspidoscelis tigris stejnegeri*	2005*	--	--	--
	2004*			
Raptor nest site	2013, 2017, 2018, 2019	33.652749, -117.192797	1 nest (inactive)	1520
Cooper's hawk *Accipiter cooperii*	06.07.2021	33.653876, -117.193126	1	1518
	05.21.2021	33.653050, -117.192942	1	1522
	2007*	--	--	--
	2005	33.652173, -117.191589	2	1524
	2004*	--	--	--
Northern harrier *Circus hudsonius*	2013*	--	--	--
	2011*	--	--	--
	2004*	--	--	--
White-tailed kite *Elanus leucurus*	04.26.2011	33.653036, -117.191520	1	Fly over
	2005	33.652143, -117.193236	1	1523
	2005	33.655034, -117.194991	1	1508

Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
California horned lark *Eremophila alpestris actia*	07.06.2021	33.649724, -117.189071	Several	1542
	06.05.2021 05.21.2021	33.650884, -117.185290	Several	1558
	05.25.2021	33.651187, -117.197238	Several	1537
	05.28.2019	33.653331, -117.191005	Several	1524
	04.16.2019	33.650844, -117.185067	Several	1557
	06.14.2018	33.653079, -117.191911	Several	1520
	05.24.2018	33.650510, -117.185130	Several	1548
	04.25.2017	33.653816, -117.188586	Several	1556
	04.08.2017	33.653324, -117.194038	Several	1519
	04.01.2017	33.652212, -117.186278	Several	1560
	09.17.2013	33.651900, -117.186140	20+	1561
	2004*	--	--	--
	07.2003*	--	--	--
Great egret *Ardea alba*	2004*	--	--	--
Great blue heron *Ardea herodias*	04.01.2017	33.655683, -117.194971	1	Fly over
	2005*	--	--	--
Lawrence's goldfinch *Spinus lawrencei*	2004*	--	-	--
Loggerhead shrike *Lanius ludovicianus*	2005	33.654408, -117.193684	1	1517
California thrasher *Toxostoma redivivum*	2005*	--	--	--
	2004*	--	--	--
Southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	2004*	--	--	--
Bell's sage sparrow *Artemisiospiza belli belli*	2004*	--	--	--
Nuttall's woodpecker *Dryobates nuttallii*	07.06.2021	33.653838, -117.193080	1 male	1517

Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
Coastal California gnatcatcher *Polioptila californica californica*	06.07.2021 05.31.2021	33.654966, -117.184909	2 males 1 female	1643
	04.16.2019	33.655093, -117.189888	1	1629
	03.11.2019[1]	33.655673, -117.184620	1	1557
	05.24.2018	33.655112, -117.185740	2 (a pair)	1576
	04.01.2017	33.655336, -117.190141	1 male	1621
	03.28.2017	33.654170, -117.185007	1 male	1656
	03.28.2017[2]	33.655604, -117.184969	2 (a pair)	1576
	04.29.2011	33.65529, -117.19003	2 (a pair)	1637
	04.26.2011	33.65548, -117.19102	1 male	1557
	04.19.2004	33.656002, -117.192037 (just offsite)	Active nest	1547
	04.04.2004	33.655400, -117.190183	Active nest	1624
	04.04.2004	33.651783, -117.184550	Active nest	1627
Burrowing owl *Athene cunicularia*	05.30.2018	33.650610, -117.188668	1 adult 1 burrow	1536
Wrentit *Chamaea fasciata*	07.11.2021	33.651355, -117.184692	1	1610
	05.31.2021	33.655169, -117.188866	1	1672
	07.2003*	--	--	--
Costa's hummingbird *Calypte costae*	2011*	--	--	--
	2004*	--	--	--
Rufous hummingbird *Selasphorus rufus*	2004*	--	--	--
San Diego black-tailed jackrabbit *Lepus californium bennettii*	05.25.2021	33.653599, -117.188042	1	1563
	06.14.2018	33.654478, -117.193719	1	1512
	03.28.2017[3]	33.654645, -117.185019	2	1650
	04.01.2017	33.654137, -117.187498	2	1583
	2013	33.655294, -117.190818	1	1563
	2013	33.651907, -117.188694	1	1545
	2013	33.649095, -117.188265	1	1570

Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
San Diego black-tailed jackrabbit *Lepus californium bennettii* (continued)	2013	33.649251, -117.179982 (offsite)	1	1513
	04.26.2011	33.649020, -117.188010	1	1579
	04.26.2011	33.651790, -117.188670	1	1546
	04.26.2011	33.655230, -117.190810	1	1557
	04.26.2011	33.655703, -117.186478	1	1661
	04.26.2011	33.654188, -117.184800	1	1667
	04.26.2011	33.652306, -117.184658	1	1632
	04.26.2011	33.654389, -117.186578	1	1607
	04.26.2011	33.654851, -117.190446	1	1592
	04.26.2011	33.655064, -117.189181	1	1657
	04.26.2011	33.655727, -117.185042	1	1570
	2004*	--	--	--

*Details of observations are not available. 1. Coastal California gnatcatcher detected during unrelated survey of adjacent property. 2. Coastal California gnatcatcher was also detected in the same approximate areas on 04.08.2017, 04.25.2017, and 05.06.2017. These are likely the same individuals previously detected in the area. 3. Black-tailed jackrabbit was also detected in the same approximate areas on 04.08.2017 and 05.06.2017; number of individuals was not determined.



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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

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Figure 9

Special Status Wildlife Observations (2003-2021)

(Photo obtained from Google Earth, August 2021)

Golden Meadows, TT 31194
City of Menifee, California

3.4.1) Listed and Fully Protected Wildlife

Biological surveys conducted on the Project site by L&L from 2003 to 2021 detected two listed or fully protected wildlife species on the site, coastal California gnatcatcher (*Polioptila californica californica*) and white-tailed kite (*Elanus leucurus*), discussed below.

Two other listed species have not been observed on the Project site during surveys but have a moderate or high potential to occur, Stephens' kangaroo rat (*Dipodomys stephensii*) and tricolored blackbird (*Agelaius tricolor*) (see Appendix B).

Stephens' kangaroo rat is federally listed as endangered and state listed as threatened. Based on potentially suitable habitat and multiple documented occurrences in the Project vicinity (CDFDW 2021c), this species has a high potential to occur on the site. Stephens' kangaroo rat is a covered species under the MSHCP and considered adequately conserved. Focused trapping surveys for this species are not required by the MSHCP.

Tricolored blackbird is state listed as threatened. Based on potentially suitable foraging habitat and several eBird records (eBird 2021) in the Project vicinity, this species has a low to moderate potential to forage on the site, but there is no suitable nesting habitat. Tricolored blackbird is a covered species under the MSHCP and considered adequately conserved.

Coastal California Gnatcatcher

Coastal California gnatcatcher is federally listed as threatened and a CDFW Species of Special Concern. Coastal California gnatcatcher is a covered species under the MSHCP and considered adequately conserved. Focused surveys for this species are not required by the MSHCP; however the MSHCP limits disturbance to outside the nesting season.

Surveys from 2004 to 2021 have documented coastal California gnatcatchers on the Project site (Table 6). Nesting was observed in 2004 and breeding pairs were present in 2011, 2017, and 2018. Coastal California gnatcatchers were observed in 2021 and, although nesting was not observed, it is likely. All observations were in the California buckwheat scrub habitat in the northeastern portion of the site (Figure 9).

White-tailed Kite

White-tailed kite (*Elanus leucurus*) is a CDFW Fully Protected species. The classification of Fully Protected was California's initial effort to identify and protect rare wildlife species. With a few exceptions, Fully Protected species have subsequently been listed under the California

and/or Federal Endangered Species Acts. One of the exceptions is white-tailed kite, which is not state or federally listed, but retains its Fully Protected status. White-tailed kite is a covered species under the MSHCP and considered adequately conserved.

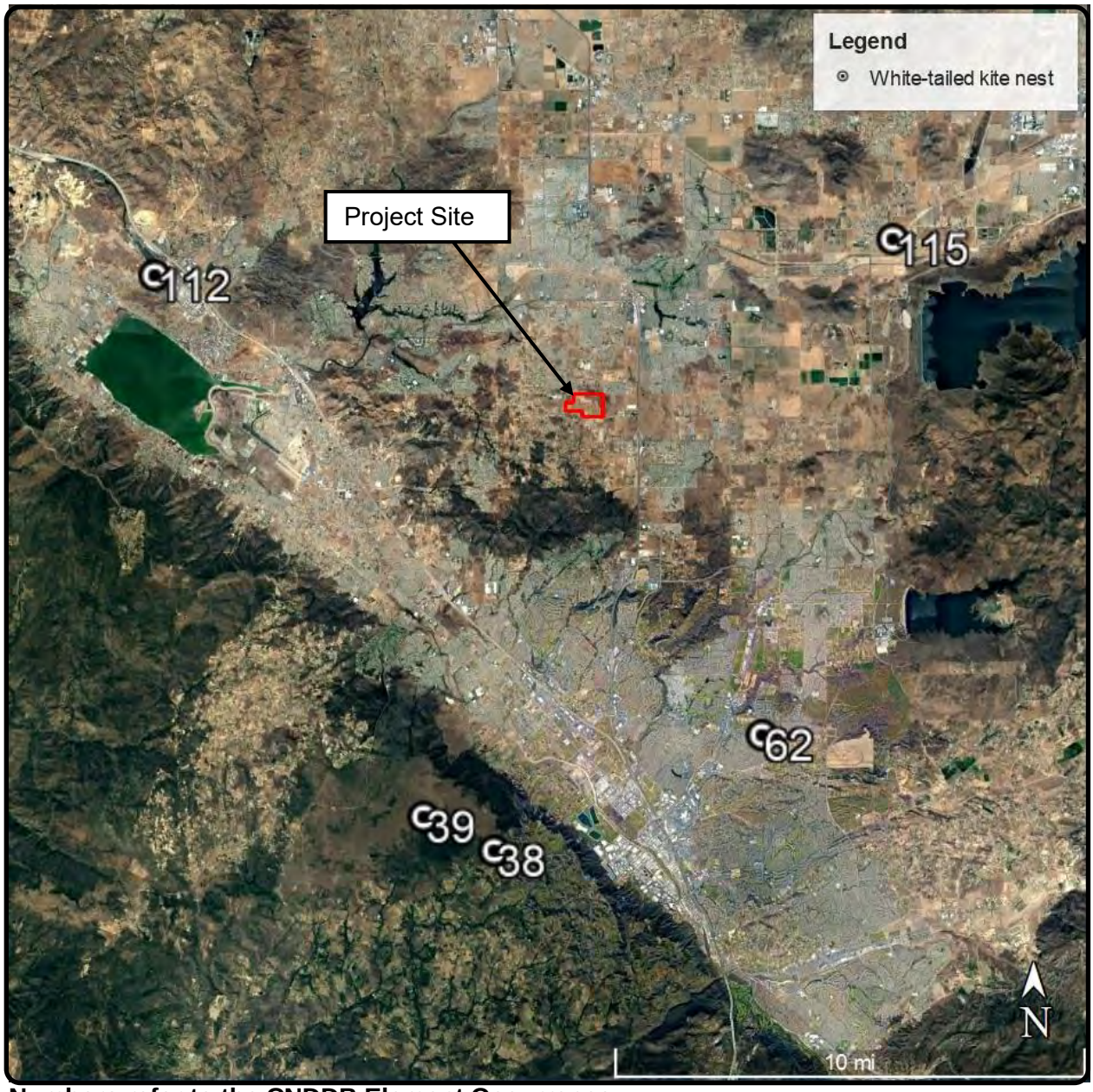
White-tailed kite forages in open grasslands, farmlands, meadows, and wetlands. Nests are located near foraging areas in substantial groves of dense, broad-leafed trees. Nests are built near the top of oaks, willows, or other trees, usually between 20 to 100 feet above the ground. The nest is composed of loosely piled sticks, lined with grass, straw, or rootlets. White-tailed kite breeds from February to October, with a peak from May to August (Zeiner et al. 1990).

The CNDDB (CDFW 2021c) has documented occurrences of five (5) white-tailed kite nests within 10 miles of the Project site (Figure 10):

> Occurrence 38 is approximately 9.3 miles south-southwest of the Project site. The occurrence is located at the Santa Rosa Plateau Preserve within oak savannah and native grassland at an elevation of 1,950 feet. Successful nesting was last documented in 1988 and 1989. Google Earth images show undisturbed habitat present in that area and the occurrence is presumed extant.
>
> Occurrence 39 is approximately 9.2 miles southwest of the Project site. The occurrence is described as located on private land between two parcels of Santa Rosa Plateau Preserve property. The habitat is oak savannah and native grassland at an elevation of 1,820 feet. The nest was last observed in 1989 (active nest, outcome unknown) and noted as threatened by proposed development. Examination of Google Earth images shows undisturbed habitat present in that area. The occurrence is presumed extant.
>
> Occurrence 62 is approximately 7.5 miles southeast of the Project site in Murrieta. The occurrence is located in southern riparian scrub habitat at an elevation of 1,240 feet. The record notes that the area was proposed for development, and Google Earth images now show the occurrence within a narrow area of habitat surrounded by residential developments. A pair of white-tailed kites was last observed in 1999. The occurrence is presumed extant but may have been extirpated by development.
>
> Occurrence 112 is approximately 9.4 miles west-northwest of the Project site and just north of Lake Elsinore. The occurrence is located in willow riparian woodland at an elevation of 1,258 feet. Successful nesting was documented in 2006. Google Earth images show undisturbed habitat at that location and the occurrence is presumed extant.

Occurrence 115 is approximately 7.1 miles northeast of the Project site. The occurrence is located in a small grove of trees associated with a rural residence in Winchester, north of Diamond Valley Lake. Agricultural fields are also present in the area. Successful nesting was documented in 2005 and 2006. Google Earth images show trees and agricultural fields remain in the area, as described in the CNDDB record. The occurrence is presumed extant.

Two white-tailed kites were observed on the Project site in 2005 and one in 2011 (Table 6, Figure 9). No kites have been observed during more recent surveys. Although this species may forage on the Project site and potentially suitable nesting habitat is present, no nesting has been observed there. A raptor nest was present in a eucalyptus tree in the riparian area on the site but has been observed during surveys to be either inactive or potentially associated with red-tailed hawk (*Buteo jamaicensis*) nesting. The 2021 survey found that this nest is no longer present.



Numbers refer to the CNDDB Element Occurrence.

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Figure 10

White-tailed Kite Nests within 10 Miles of the Project Site
(Photo obtained from Google Earth, August 2021)

Golden Meadows, TT 31194
City of Menifee, California

Fairy Shrimp

The two listed fairy shrimp species known from the area are vernal pool fairy shrimp (*Branchinecta lynchi*), a federally listed threatened species, and Riverside fairy shrimp (*Streptocephalus woottoni*), a federally listed endangered species. Both species are covered by the MSHCP and surveys are required where suitable habitat is present.

Vernal pool fairy shrimp is restricted to seasonal pools and prefers cool-water pools that are often short lived. Riverside fairy shrimp is restricted to deep seasonal vernal pools, ephemeral ponds, stock ponds, and other human-modified depressions. Riverside fairy shrimp prefers warm-water pools that remain filled for extended periods of time (Dudek 2003).

Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys. No fairy shrimp or potential fairy shrimp habitat was observed during current or previous surveys.

Riparian Birds

Least Bell's vireo (*Vireo bellii pusillus*) is state and federally listed as endangered. It is a covered species under the MSHCP and considered adequately conserved, but surveys are required in suitable habitat as described in MSHCP Section 6.1.2 and mitigation is required if the species is present. This species is migratory and breeds in California, arriving in March and departing by September or October. Males establish and defend territories in riparian woodlands and riparian scrub. Territory size ranges from 0.5 to 7.5 acres (USFWS 1998). Dense shrub cover is required for nesting.

There are two (2) CNDDB documented occurrences of nesting least Bell's vireo within five (5) miles of the site. The closest is Element Occurrence (EO) #412, located along the San Jacinto River just south of Canyon Lake, 4.2 miles to the west-northwest of the site. This occurrence is from 2002 and documents one (1) least Bell's vireo territory.

EO #407 is 4.5 miles west-northwest of the site along the San Jacinto River east of Lake Elsinore. This occurrence had one least Bell's vireo territory in 2003, two territories in 2004 and 2005, one singing male in 2006, six territories and two pairs with fledglings in 2009, and nine territories in 2010.

Southwestern willow flycatcher (*Empidonax traillii extimus*) is state and federally listed as endangered. It is a covered species under the MSHCP and considered adequately conserved, but surveys are required in suitable habitat as described in MSHCP Section 6.1.2 and mitigation is required if the species is present. This species inhabits dense riparian forests with ample numbers of willows and other associated trees and shrubs.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is federally listed as threatened and state listed as endangered. It is a covered species under the MSHCP and considered adequately conserved, but surveys are required in suitable habitat as described in MSHCP Section 6.1.2 and mitigation is required if the species is present. This species inhabits extensive riparian thickets or forests with dense, low-level or understory foliage and abutting on slow-moving watercourses, backwaters, or seeps.

There are no CNDDB documented occurrences of nesting southwestern willow flycatcher or western yellow-billed cuckoo within five (5) miles of the site.

The habitat assessment found that riparian vegetation on the site is distributed intermittently along a linear area that is approximately 1,500-feet long (Figure 7). The riparian area is no more than two or three shrubs across at its widest points and surrounded by agricultural fields. The understory is poorly developed and has several introduced species. Representative photos are included in Appendix D.

No least Bell's vireo, southwestern willow flycatcher, or western yellow-billed cuckoo have been incidentally detected during surveys. Riparian vegetation onsite is scattered and degraded, the understory is poorly developed, and the streambed does not have persistent water flow. Typical habitat to support least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo is not present and these species are considered absent from the site.

Quino Checkerspot Butterfly

Quino checkerspot butterfly (*Euphydryas editha quino*) is federally listed as endangered. No adults, larvae, or pupae were observed onsite during focused surveys in 2004, although potentially suitable habitat and larval host and nectaring plant species are present. This species has not been incidentally observed during any subsequent surveys. Quino checkerspot butterfly is a covered species under the MSHCP and considered adequately conserved. Focused surveys are not required by the MSHCP.

3.4.2) Special Status Wildlife

In addition to coastal California gnatcatcher and white-tailed kite, discussed above, biological surveys conducted on the Project site by L&L from 2003 to 2021 detected 19 special status wildlife species on the site:

- orange-throated whiptail (*Aspidoscelis hyperythra*; CDFW Watch List),
- coastal (western) whiptail (*Aspidoscelis tigris stejnegeri*; CDFW Species of Special Concern),
- coast horned lizard (*Phrynosoma blainvillii*; CDFW Species of Special Concern),
- Cooper's hawk (*Accipiter cooperi*; CDFW Watch List),
- southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*; CDFW Watch List species),
- great egret (*Ardea alba*; CDFW Special Animal),
- great blue heron (fly over) (*Ardea herodias*; CDFW Special Animal),
- Bell's sage sparrow (*Artemisiospiza belli belli*; USFWS Bird of Conservation Concern, CDFW Watch List species),
- burrowing owl (*Athene cunicularia*, USFWS Bird of Conservation Concern, CDFW Species of Special Concern),
- Costa's hummingbird (*Calypte costae*; USFWS Bird of Conservation Concern, CDFW Special Animal),
- wrentit (*Chamaea fasciata*; USFWS Bird of Conservation Concern),
- northern harrier (*Circus cyaneus*; CDFW Species of Special Concern),
- Nuttall's woodpecker (*Dryobates nuttallii*; USFWS Bird of Conservation Concern),
- California horned lark (*Eremophila alpestris actia*; CDFW Watch List),
- loggerhead shrike (*Lanius ludovicianus*; USFWS Bird of Conservation Concern, CDFW Species of Special Concern),
- rufous hummingbird (*Selasphorus rufus*; USFWS Bird of Conservation Concern, CDFW Special Animal),
- Lawrence's goldfinch (*Spinus lawrencei*; USFWS Bird of Conservation Concern, CDFW Special Animal),
- California thrasher (*Toxostoma redivivum*; USFWS Bird of Conservation Concern), and
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*; CDFW Species of Special Concern).

All of these species are covered under the MSHCP and considered adequately conserved, with the exception of great egret, Costa's hummingbird, wrentit, Nuttall's woodpecker, rufous hummingbird, Lawrence's goldfinch, and California thrasher, which are not covered under the MSHCP. Burrowing owl is discussed below. Special status species observations are listed in Table 6 and mapped on Figure 9.

Five (5) additional special status wildlife species have a low to moderate potential to occur on the Project site but have not been observed during L&L surveys (see Appendix B). These species are:

- Crotch bumble bee (*Bombus crotchii*; CDFW Special Animal[2]),
- southern California legless lizard (*Anniella stebbinsi*; CDFW Species of Special Concern),
- Dulzura pocket mouse (*Chaetodipus californicus femoralis*; CDFW Species of Special Concern),
- northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*; CDFW Species of Special Concern), and
- western mastiff bat (foraging) (*Eumops perotis californicus*; CDFW Species of Special Concern).

Northwestern San Diego pocket mouse is covered under the MSHCP and considered adequately conserved. The remaining four species are not covered under the MSHCP.

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is protected under the federal Migratory Bird Treaty Act and California Fish and Game Code and is a CDFW Species of Special Concern. It is a small, ground-dwelling owl found in open dry grassland, desert, or shrubland areas and in uncultivated agricultural areas, rangelands, and other open areas with low-growing vegetation.

Burrows are an essential element of burrowing owl habitat. Although the burrowing owl is capable of excavating its own burrows in soft soils, it typically modifies and inhabits abandoned

[2] Crotch bumble bee was previously a candidate for state listing, but the Sacramento Superior Court ruled that insects are not eligible for listing under the California Endangered Species Act: *Almond Alliance of California v. California Department of Fish and Wildlife*, Sacramento Superior Court No. 34-2019-80003216 (Nov. 13, 2020). The California Fish and Game Commission filed an intent to appeal this decision in February 2021. The status of this species may be affected by subsequent litigation or changes to regulations.

burrows of small mammals, such as ground squirrels and pocket gophers. The burrowing owl has also been known to use man-made structures such as cement culverts, debris piles, and other artificial burrows.

Occupancy of burrowing owl habitat can be verified at a site by observation of at least one (1) owl or sign of owl (molted feathers, cast pellets, prey remains, eggshell fragments, or excrement) at or near a burrow entrance. A site is considered occupied if at least one (1) owl has been identified onsite in the past three (3) years, because (if undisturbed) burrowing owls exhibit high site fidelity (CDFG 2012, CBOC 1993).

The site has suitable burrowing owl habitat. Focused surveys for burrowing owl in 2005, 2006, 2007, 2011, and 2013 did not detect burrowing owls utilizing the site. No burrowing owl or sign was observed during 2017 general biological surveys.

Focused surveys in 2018 observed a single adult burrowing owl onsite and one (1) burrow with signs of occupation (Table 6, Figure 9). The owl was observed on May 30, 2018. The occupied burrow was found very close to where the owl was observed. Pellets, scat, feathers, owl tracks, and pieces of shredded cloth were observed at the burrow entrance. The burrow was monitored during subsequent site visits, but there were no additional observations of burrowing owl adults or juveniles. It was not determined if the owl was using the burrow for nesting. Coyote and/or dog tracks were observed around the burrow, but the burrow itself was not disturbed and there were no signs that owls had been predated. No other active burrows or burrowing owls were observed during surveys in 2018.

Focused surveys in 2019 did not detect any burrowing owl, occupied burrows, or owl sign. The agricultural fields on the site, including the site of the 2018 burrow observation, had tall, dense non-native vegetation at that time, which created unsuitable conditions for burrowing owl. Thick vegetation was also present at the burrow site in 2021, until the agricultural fields were mowed (sometime between August and November surveys).

No burrowing owls, owl sign (pellets, scat, feathers, tracks, etc.), or occupied burrows were observed onsite during the 2021 protocol breeding season survey. No owls or owl sign were observed at the 2018 burrow site in November 2021 after the agricultural fields were mowed. Potentially suitable burrowing owl habitat is present on the site, including small mammal burrows. Potentially suitable habitat is also present within the 150-meter buffer area (Figure 5), but no owls, owl sign, or occupied burrows were observed in the buffer.

There are 47 CNDDB documented occurrences of burrowing owl within five (5) miles of the Project site (CDFW 2021c). These occurrences date between 1998 and 2016.

Because suitable habitat is present, the MSHCP requires a preconstruction clearance survey for burrowing owl within 30 days prior to the start of site disturbance. If burrowing owls are found on the site at that time, additional mitigation is required under the MSHCP (see Section 6.10).

Nesting Birds

There is habitat suitable for nesting birds (including raptors) within and adjacent to the site. Nesting birds may utilize trees, shrubs, and other vegetation, and open ground on and adjacent to the site for nesting. Some relatively large eucalyptus trees are present on the western portion of the site and along the western boundary along Evans Road. Red-tailed hawks (*Buteo jamaicensis*) have been observed onsite and may be utilizing the trees for nesting.

A potential (inactive) raptor nest site was found in a large eucalyptus tree on the site in 2013. It was located in a eucalyptus tree in the west-central portion of the site (Table 6, Figure 9). No raptors were observed utilizing the nest site during surveys in 2013, 2017, 2018, and 2019. The 2021 survey found that the nest was no longer present and likely fell from the tree.

3.4.3) Wildlife Corridor

Wildlife corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated “islands” of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because movement barriers prohibit the infusion of new individuals and genetic variation.

Wildlife movement activities usually fall into one of three movement categories: dispersal (e.g., juvenile animals dispersing from natal areas or individuals extending their range), seasonal migration, and movements related to home range activities (e.g., foraging for food or water, defending territories, or searching for mates, breeding areas, or cover).

Drainages often serve as wildlife corridors and travel routes; however, the riparian vegetation on the site is not continuous. The site is largely surrounded by scattered existing development and

there is no connectivity between the site and conserved lands to the east (Diamond Valley Lake) and southwest (Santa Rosa Plateau, Cleveland National Forest).

The California Essential Habitat Connectivity Project (CDFW 2021d) maps the Project site and surrounding areas as "limited connectivity opportunity." Although there may be limited local movement of wildlife on and across the site, it is not within or adjacent to a wildlife corridor or potential corridor.

3.5) Jurisdictional Waters/Wetlands and MSHCP Riparian/Riverine and Vernal Pool Habitat

Under MSHCP Volume 1, Section 6.1.2, areas associated with wetland and streambed systems must be evaluated for consideration as riparian/riverine or vernal pool habitat. Riparian/riverine areas are defined within the MSHCP as:

> ". . . lands which contain Habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year."

Vernal pools are defined within the MSHCP as:

> ". . . seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. . ."

An ephemeral drainage is present on the site and mapped as a USGS blue-line stream (Figure 11). This drainage includes riparian vegetation such as arroyo willow, Fremont cottonwood, and mulefat (see Section 3.2.3). A jurisdictional delineation was completed in 2011 and updated in 2018 and 2019.

The delineation found 0.153 acre of unvegetated state streambed (which is also MSHCP riverine habitat) and 1.208 acre of state wetland (which is also MSHCP riparian habitat). The survey also identified 0.065 acre of federal Waters of the U.S. (WoUS), none of which is federal wetland (Table 7).

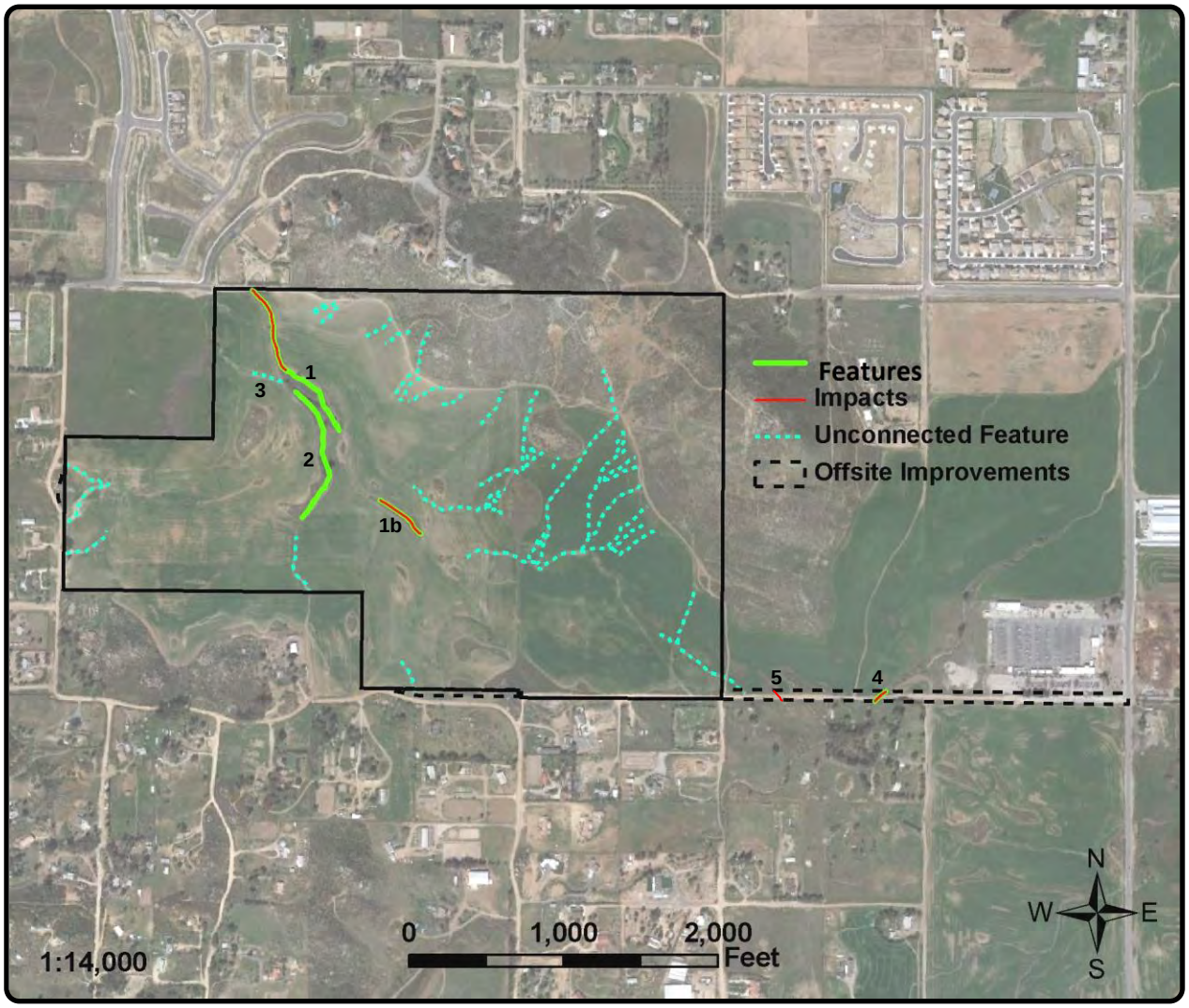
All jurisdictional areas onsite will either be impacted by Project development or incorporated into the Avoidance Area (Figure 12). The Avoidance Area will retain native riparian habitat.

Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys.

Table 7. Summary of Jurisdictional Resources Present

Feature	Total Present (acres)			
	State Streambed / MSHCP Riverine	State Wetland / MSHCP Riparian	Federal Waters	Federal Wetland
1	0.037	0.373	0.005	0
1b	0.025	0.148	0.025	0
2	0.065	0.642	0.025	0
3	0	0	0	0
4 (offsite)	0.023	0.046	0.009	0
5 (offsite)	0.004	0	0.001	0
TOTALS*	0.153	1.208	0.065	0

*Any discrepancy in totals due to rounding error.



L&L Environmental, Inc.

BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
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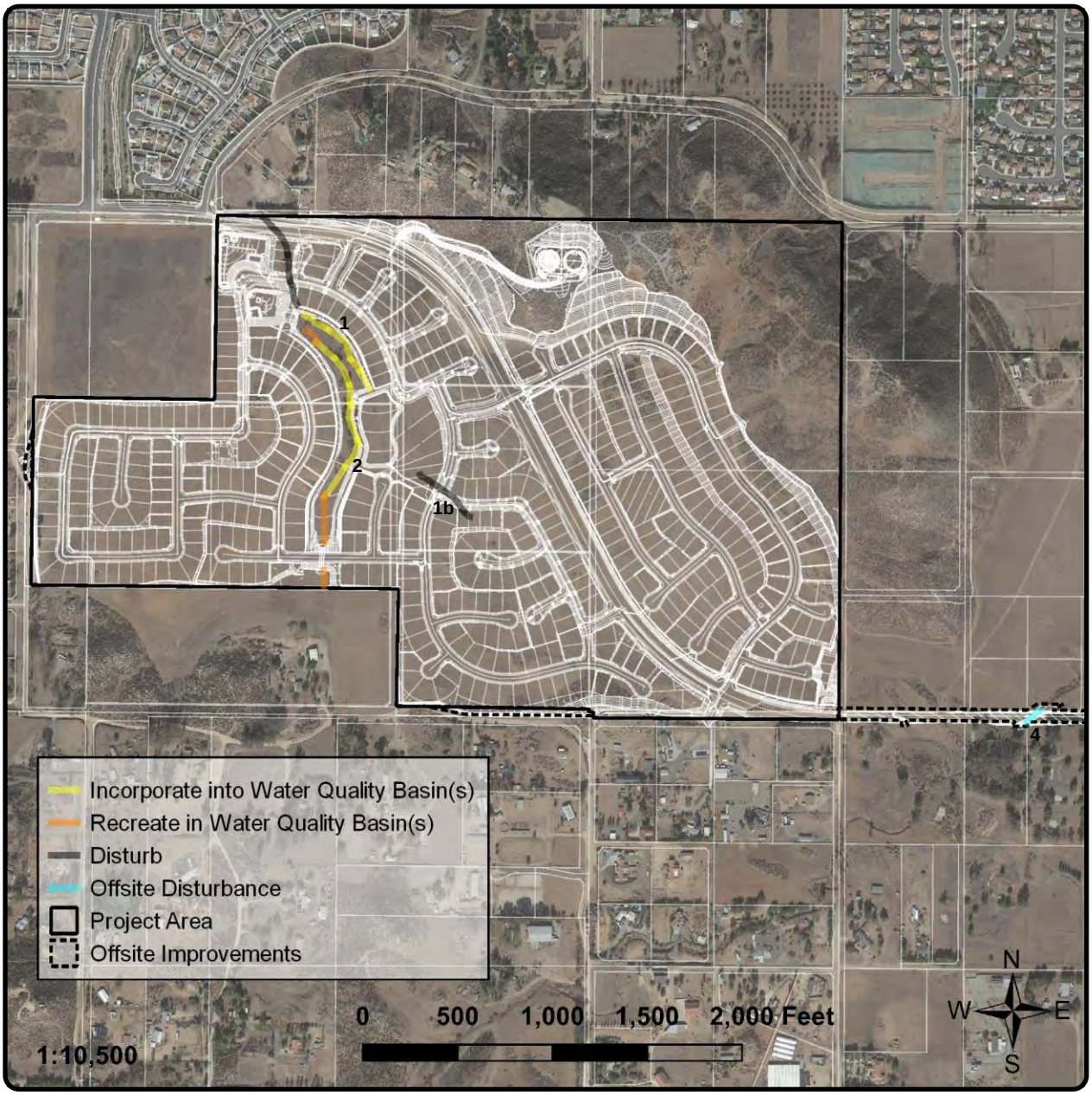
Figure 11

Jurisdictional Areas
(Photo obtained from Google Earth, 3-9-2011)

Golden Meadows, TT 31194
City of Menifee, California



L&L Environmental, Inc.

BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
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Figure 12

Jurisdictional Areas with Development Plan

(Plan obtained from Hunsaker & Assoc. Irvine, Inc., 2021)

Menifee Assemblage, TT 31194
City of Menifee, California

4.0) URBAN WILDLANDS INTERFACE ANALYSIS

The Project proposes an Avoidance Area along the riparian area on the site as well as an Open Space Area in the northeast corner of the site. An Urban Wildlands Interface Analysis is included here in case the MSHCP requires implementation of the Urban Wildlands Interface Guidelines (Section 6.1.4 of the MSHCP). If these areas are not conserved and/or the Urban Wildlands Interface Guidelines are not applicable, this section will be withdrawn.

The main portion of the Avoidance Area will be a channel about five (5) feet deep with 4:1 slopes. At the south end is a smaller portion that will be contoured as a basin about five (5) feet deep with 4:1 slopes. Offsite flows from the south will be picked up by v-ditches along the tract boundary and the ditches will convey the flows to this basin. Water will flow from the basin underneath an internal street and into the main portion of the Avoidance Area through a box culvert. The Avoidance Area will retain native riparian habitat.

The Avoided Area and Open Space Area will be owned and maintained by the Homeowners Association (HOA) according to HOA guidelines.

4.1) Drainage

Runoff from the development will be treated in water quality basins to remove common pollutants and reduce peak flows before being discharged into the Avoidance Area.

During construction, all contractors and subcontractors will use Best Management Practices (BMPs) to manage, capture, control, eliminate, and prevent sediment, debris, and pollutants from being discharged into streambeds and drainages. A Storm Water Pollution Prevention Plan (SWPPP) has been prepared for the Project. Construction BMPs address sediment and erosion control, non-sediment pollutants, and non-storm water BMPs.

If grading occurs when the ephemeral streambed is wetted, a bypass will be required. A Bypass Plan will be developed by the SWPPP consultant prior to initiation of grading unless all grading can occur when the ephemeral streambed is dry.

Post-construction BMPs include minimizing urban runoff, minimizing the impervious footprint, conserving natural areas, and minimizing Directly Connected Impervious Areas (DCIAs). Project plans incorporate BMPs to address water quality in low flows and first flush storm runoff, as well as to control post-construction peak flow volumes. These BMPs include three (3)

detention basins, two (2) infiltration basins, three (3) sand filter basins, two (2) modular wetland systems, and a CDS (Continuous Deflective Separation) stormwater treatment unit.

4.2) Toxics

Land uses proposed in proximity to the Avoidance Area that use chemicals that are potentially toxic, or that may adversely affect wildlife species, habitat, or water quality shall incorporate measures to ensure that application of such chemicals does not result in discharge to the Avoidance Area. The greatest risk is from landscaping fertilizer and herbicide/pesticide runoff.

4.3) Fencing

The siting and design of fencing should not impede wildlife movement. Given the location of the Avoidance Area within the residential development, wildlife using the site are likely to be common species that are comfortable with proximity to human disturbance.

The Project boundary and back and side yards will be fenced according to a fencing plan approved by the lead agency. No direct access between residences and the Open Space Area or the Avoidance Area will occur or be allowed.

Mitigation Measure 4.3-7 in the 2006 EIR requires individual lot fencing to be used to restrict access to the on-site wetland areas. Back yard gates from individual residential lots that open onto the wetland area shall be prohibited.

4.4) Barriers

Proposed land uses adjacent to the Avoidance Area and Open Space Area shall incorporate barriers in Project designs, where appropriate, to minimize unauthorized public access, domestic animal predation, illegal trespass, or trash dumping. Such barriers may include native landscaping, rocks/boulders, fencing, walls, signage, and/or other appropriate mechanisms.

The Project will install two (2) or more information boards (to be located at each end of the Avoidance Area and at other access points, as needed) providing a description of suitable uses and asking residents to remain on existing trails and to keep pets on a leash.

4.5) Lighting

Night lighting shall be directed away from the Avoidance Area and Open Space Area to protect species from direct night lighting. Shielding shall be incorporated in Project designs to ensure ambient lighting in the Avoidance Area and Open Space Area is not substantially increased.

Mitigation Measure 4.3-8 in the 2006 EIR requires that night lighting during and after project construction shall be directed away from onsite wetland areas and, except for safety and other requirements, lighting shall be limited from the boundaries of onsite wetland areas. In the event that lighting in an area adjacent to the wetland area is necessary, a shield shall be incorporated in Project designs to ensure ambient lighting in the wetland area is not increased.

4.6) Noise

Proposed noise-generating land uses affecting the Avoidance Area and Open Space Area shall incorporate setbacks, berms, or walls to minimize the effects of noise on wildlife resources pursuant to applicable rules, regulations, and guidelines related to land use noise standards.

4.7) Invasives

Invasive species (refer to MSHCP Table 6-2, below) shall not be used in development or restoration plan activities. Mitigation Measure 4.3-9 in the 2006 EIR requires that the landscape plans for the Project in areas adjacent or tributary to wetland areas shall not include those species listed in the MSHCP as “Plants That Should Be Avoided Adjacent to The MSHCP Conservation Area” (MSHCP Table 6-2).

4.8) Grading/Land Development

Manufactured slopes will be required to extend into the Avoidance Area to support the Project design. Grading should not extend into the Open Space Area.

4.9) Weed Abatement/Fuel Modification

Weed abatement and fuel modification zones may encroach into portions of the Avoidance Area. Weed abatement and fuel modification zones should not encroach into the Open Space Area.

MSHCP Table 6-2. Plants That Should Be Avoided Adjacent to the MSHCP Conservation Area (Taken Directly from MSHCP Section 6.1.4)

BOTANICAL NAME	COMMON NAME
Acacia spp. (all species)	acacia
Achillea millefolium var. *millefolium*	common yarrow
Ailanthus altissima	tree of heaven
Aptenia cordifolia	red apple
Arctotheca calendula	cape weed
Arctotis spp. (all species & hybrids)	African daisy
Arundo donax	giant reed or arundo grass
Asphodelus fistulosus	asphodel
Atriplex glauca	white saltbush
Atriplex semibaccata	Australian saltbush
Carex spp. (all species*)	sedge
Carpobrotus chilensis	ice plant
Carpobrotus edulis	sea fig
Centranthus ruber	red valerian
Chrysanthemum coronarium	annual chrysanthemum
Cistus ladanifer (incl. hybrids/varieties)	gum rockrose
Cortaderia jubata [*syn.C. Atacamensis*]	jubata grass, pampas grass
Cortaderia dioica [syn. *C. sellowana*]	pampas grass
Cotoneaster spp. (all species)	cotoneaster
Cynodon dactylon (incl. hybrids varieties)	Bermuda grass
Cyperus spp. (all species*)	nutsedge, umbrella plant
Cytisus spp. (all species)	broom
Delosperma 'Alba'	white trailing ice plant
Dimorphotheca spp. (all species)	African daisy, Cape marigold
Drosanthemum floribundum	rosea ice plant
Drosanthemum hispidum	purple ice plant
Eichhornia crassipes	water hyacinth
Elaegnus angustifolia	Russian olive
Eucalyptus spp. (all species)	eucalyptus or gum tree
Eupatorium coelestinum [syn. *Ageratina* sp.]	mist flower
Festuca arundinacea	tall fescue
Festuca rubra	creeping red fescue
Foeniculum vulgare	sweet fennel
Fraxinus uhdei (and cultivars)	evergreen ash, shamel ash
Gaura (spp.) (all species)	gaura
Gazania spp. (all species & hybrids)	gazania
Genista spp. (all species)	broom
Hedera canariensis	Algerian ivy
Hedera helix	English ivy
Hypericum spp. (all species)	St. John's Wort
Ipomoea acuminata	Mexican morning glory
Lampranthus spectabilis	trailing ice plant
Lantana camara	common garden lantana
Lantana montevidensis [syn. *L. sellowiana*]	lantana
Limonium perezii	sea lavender
Linaria bipartita	toadflax
Lolium multiflorum	Italian ryegrass
Lolium perenne	perennial ryegrass
Lonicera japonica (incl. 'Halliana')	Japanese honeysuckle
Lotus corniculatus	birdsfoot trefoil

MSHCP Table 6-2. Plants That Should Be Avoided Adjacent to the MSHCP Conservation Area (Continued)

BOTANICAL NAME	COMMON NAME
Lupinus arboreus	yellow bush lupine
Lupinus texanus	Texas blue bonnets
Malephora crocea	ice plant
Malephora luteola	ice plant
Mesembryanthemum nodiflorum	little ice plant
Myoporum laetum	myoporum
Myoporum pacificum	shiny myoproum
Myoporum parvifolium (incl. 'Prostratum')	ground cover myoporum
Oenothera berlandieri	Mexican evening primrose
Olea europea	European olive tree
Opuntia ficus-indica	Indian fig
Osteospermum spp. (all species)	trailing African daisy, African daisy,
Oxalis pes-caprae	Bermuda buttercup
Parkinsonia aculeata	Mexican palo verde
Pennisetum clandestinum	Kikuyu grass
Pennisetum setaceum	fountain grass
Phoenix canariensis	Canary Island date palm
Phoenix dactylifera	date palm
Plumbago auriculata	cape plumbago
Polygonum spp. (all species)	knotweed
Populus nigra 'italica'	Lombardy poplar
Prosopis spp. (all species*)	mesquite
Ricinus communis	castorbean
Robinia pseudoacacia	black locust
Rubus procerus	Himalayan blackberry
Sapium sebiferum	Chinese tallow tree
Saponaria officinalis	bouncing bet, soapwart
Schinus molle	Peruvian pepper tree, California pepper
Schinus terebinthifolius	Brazilian pepper tree
Spartium junceum	Spanish broom
Tamarix spp. (all species)	tamarisk, salt cedar
Trifolium tragiferum	strawberry clover
Tropaelolum majus	garden nasturtium
Ulex europaeus	prickly broom
Vinca major	periwinkle
Yucca gloriosa	Spanish dagger

An asterisk (*) indicates some native species of the genera exist that may be appropriate.

Sources: California Exotic Pest Plant Council, United States Department of Agriculture-Division of Plant Health and Pest Prevention Services, California Native Plant Society, *Fremontia* Vol. 26 No. 4, October 1998, *The Jepson Manual: Higher Plants of California*, and County of San Diego Department of Agriculture.

5.0) SUMMARY AND RECOMMENDATIONS

The purpose of this study was to identify biological resources present or potentially present on the site. The MSHCP requires a habitat assessment to address riparian/riverine and vernal pool habitats and associated species and burrowing owl. Focused surveys are required if suitable habitat is present.

L&L also analyzed the potential for impacts to state and federal jurisdictional waters, special status species, and sensitive vegetation communities. The recommendations are based on the literature review, L&L's knowledge of species and habitats in the region, the biological field survey, and analysis of aerial images.

MSHCP

The site is located within the area covered by the MSHCP but is not within the Criteria Area. There is one area of PQP Conserved Lands approximately 0.68 miles north-northeast of the site (Ringing Rock Archaeological Site). There are no other PQP or MSHCP Conserved Lands within a mile of the site. The site is not within or near any MSHCP Core Areas or Linkages.

Sensitive Vegetation Communities

The site is composed of agricultural lands and disturbed/ruderal areas, California buckwheat scrub, chamise chaparral, arroyo willow thickets, and mulefat thickets. Arroyo willow thickets and mulefat thickets are riparian vegetation communities and arroyo willow thicket is considered sensitive. The majority of arroyo willow thicket will be retained in the Avoidance Area.

Listed and Special Status Plant Species

No state or federally listed plants were observed during surveys and the Project site is not within USFWS designated critical habitat for any listed plant species. Two special status plant species were observed on the site during surveys, long-spined spineflower and southern California black walnut. Both are covered species under the MSHCP and considered adequately conserved.

Trees

There is a single immature coast live oak tree present on the site within the riparian area. Other native and non-native trees are also present. The City may regulate removal or replacement of trees and a tree survey may be required.

Listed and Fully Protected Wildlife Species

Surveys detected two listed or fully protected wildlife species on the site, coastal California gnatcatcher and white-tailed kite.

Multiple surveys from 2004 through 2021 have documented coastal California gnatcatchers on the Project site, including observations of breeding pairs and nesting. All observations were in the California buckwheat scrub habitat in the northeastern portion of the site. Under Mitigation Measure 4.3-1 of the 2006 EIR, the northeastern portion of the property shall be preserved as open space and covered by a conservation easement or similar mechanism. Coastal California gnatcatcher is a covered species under the MSHCP and considered adequately conserved. Focused surveys for this species are not required under the MSHCP. Scheduling Project activities outside the nesting season and/or conducting preconstruction nesting bird clearance surveys and establishing avoidance buffers around any active nests is recommended, as described below. Monitoring of active nest sites during Project activities is recommended.

Two white-tailed kites were observed on the Project site in 2005 and one in 2011. No kites have been observed during more recent surveys. Although this species may forage on the Project site and potentially suitable nesting habitat is present, no nesting has been observed there. White-tailed kite is a covered species under the MSHCP and considered adequately conserved.

Under Mitigation Measure 4.3-5 of the 2006 EIR, if construction activities occur between February 1 and August 31 and within 150 feet of suitable nesting locations, a focused raptor survey will be required prior to issuance of grading permits. If active nests are located within the portion of the site to be disturbed or within 150 feet of the area to be disturbed, measures shall be initiated to avoid any impacts to nesting raptors, including avoidance buffers around active nests. Under this mitigation measure, if white-tailed kite nesting is found on the Project site, an incidental take permit from CDFW is required.

Two other listed species have not been observed on the Project site during surveys but have a moderate or high potential to occur, Stephens' kangaroo rat and tricolored blackbird (foraging). Stephens' kangaroo rat is a covered species under the MSHCP and considered adequately conserved. Focused trapping surveys for this species are not required by the MSHCP. Tricolored blackbird is also a covered species under the MSHCP and considered adequately conserved.

Fairy Shrimp

Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys. No fairy shrimp or potential fairy shrimp habitat was observed during current or previous surveys.

Riparian Birds

No least Bell's vireo, southwestern willow flycatcher, or western yellow-billed cuckoo have been incidentally detected during surveys. Riparian vegetation onsite is scattered and degraded, the understory is poorly developed, and the streambed does not have persistent water flow. Typical habitat to support least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo is not present and these species are considered absent from the site.

Quino Checkerspot Butterfly

No Quino checkerspot butterfly adults, larvae, or pupae were observed onsite during focused surveys in 2004, although potentially suitable habitat and larval host and nectaring plants are present. This species has not been incidentally observed during any subsequent surveys. Quino checkerspot butterfly is a covered species under the MSHCP and considered adequately conserved. Focused surveys are not required by the MSHCP.

Special Status Wildlife Species

Biological surveys from 2003 to 2021 detected 19 special status wildlife species on the site: orange-throated whiptail, coastal (western) whiptail, coast horned lizard, Cooper's hawk, southern California rufous-crowned sparrow, great egret, great blue heron (fly over), Bell's sage sparrow, burrowing owl, Costa's hummingbird, wrentit, northern harrier, Nuttall's woodpecker, California horned lark, loggerhead shrike, rufous hummingbird, Lawrence's goldfinch, California thrasher, and San Diego black-tailed jackrabbit.

All of these species are covered under the MSHCP and considered adequately conserved, with the exception of great egret, Costa's hummingbird, wrentit, Nuttall's woodpecker, rufous hummingbird, Lawrence's goldfinch, and California thrasher, which are not covered under the MSHCP. Burrowing owl is discussed below. Scheduling Project activities outside the nesting season or conducting preconstruction nesting bird clearance surveys and establishing avoidance buffers around any active nests is recommended, as described below.

Five (5) additional special status wildlife species have not been observed on the Project site during L&L surveys but have a low to moderate potential to occur. These species are Crotch bumble bee, southern California legless lizard, Dulzura pocket mouse, northwestern San Diego pocket mouse, and western mastiff bat (foraging). Northwestern San Diego pocket mouse is covered under the MSHCP and considered adequately conserved. The remaining four species are not covered under the MSHCP.

Crotch bumble bee was previously a candidate for state listing, but in November 2020 the Sacramento Superior Court ruled that insects are not eligible for listing under the California Endangered Species Act. The California Fish and Game Commission filed an intent to appeal this decision in February 2021. The status of this species may be affected by subsequent litigation or changes to regulations. If Crotch bumble bee becomes a listed or candidate species, focused surveys and incidental take permitting may be required.

Burrowing Owl

One (1) adult burrowing owl and an occupied burrow were observed onsite in 2018. No owls or owl sign were observed in 2019 or 2021. Because suitable habitat is present, the MSHCP requires a preconstruction clearance survey for burrowing owl within 30 days prior to the start of site disturbance. If burrowing owls are found on the site at that time, additional mitigation is required under the MSHCP and Mitigation Measure 4.3-2 of the 2006 EIR.

Nesting Birds

There is habitat suitable for nesting birds (including raptors) within and adjacent to the site. Nesting birds may utilize trees, shrubs, and other vegetation, and open ground on and adjacent to the site for nesting.

Nesting birds are protected under state and federal laws. Project activities, including initial vegetation trimming/clearing, tree trimming/removal, ground disturbance, etc., should be avoided during the nesting season (generally February 1 to August 31). If the nesting season cannot be avoided, a nesting bird clearance survey is recommended within three (3) days prior to the start of Project activities within the nesting season. If active nests are present, avoidance of nest sites is required and a buffer of 300 to 500 feet (or as determined by a biologist) is recommended until a biologist has verified that juvenile birds are no longer dependent on the nest or the nest has otherwise become inactive. An active nest is defined as a nest with eggs, chicks, or dependent juveniles, or a nest actively being constructed or utilized for reproduction.

Wildlife Corridors

The site is largely surrounded by scattered existing development and there is no connectivity between the site and conserved lands to the east and southwest. Although there may be limited local movement of wildlife on and across the site, it is not within or adjacent to a wildlife corridor or potential corridor.

Jurisdictional Waters/Wetlands and MSHCP Riparian/Riverine and Vernal Pool Habitat

An ephemeral drainage with scattered riparian vegetation is present on the site and mapped as a USGS blue-line stream. A jurisdictional delineation found 0.153 acre of unvegetated state streambed (which is also MSHCP riverine habitat) and 1.208 acre of state wetland (which is also MSHCP riparian habitat). The survey also identified 0.065 acre of federal waters. There is no federal wetland.

All jurisdictional areas onsite will either be impacted by Project development or incorporated into the Avoidance Area. Monitoring of Project activities adjacent to the Avoidance Area is recommended.

Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys.

Regulatory permits from USACE, RWQCB, and CDFW will be required for impacts to jurisdictional areas. A DBESP will be required for impacts to MSHCP riparian/riverine habitat. Mitigation Measure 4.3-6 also requires on or off-site replacement of CDFW and federal jurisdictional waters and wetlands at a ratio of no less than 1:1 and incorporation of design features that will avoid biological impacts to offsite blue-line streams that flow to Canyon Lake. Monitoring of Project activities that disturb vegetation or soil in and adjacent to the Avoidance Area is recommended.

6.0) REGULATORY ENVIRONMENT

The following summary of the regulatory environment is provided for information purposes and is not intended for review or comment by the lead or wildlife agencies.

6.1) Federal Endangered Species Act

Section 9 of the federal Endangered Species Act (FESA), 1973 (as amended) prohibits "take" of federally listed threatened and endangered species. Candidate species receive no protection under FESA, but the USFWS encourages conservation of these species. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. "Harm" is further defined to include habitat modification or degradation when it actually kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering.

Incidental take is take that results from, but is not the purpose of, carrying out an otherwise lawful activity. Incidental take of federally listed species may be authorized under Section 7 of FESA for federal properties or where federal actions (i.e., federal permitting or federal funding) are involved or under Section 10 of FESA for non-federal actions.

Section 7 requires all Federal agencies, in "consultation" with the USFWS, to ensure that their actions are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat. The Section 7 process requires preparation of a federal Biological Assessment to determine whether a proposed major construction activity under the authority of a Federal action agency is likely to adversely affect listed species, proposed species, or designated critical habitat. After formal consultation, the USFWS will issue a Biological Opinion stating whether or not a federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

Section 10 lays out the guidelines under which a permit may be issued to authorize take of endangered or threatened species (in the absence of any federal nexus). Application for an incidental take permit under Section 10 is subject to certain requirements, including preparation by the permit applicant of a conservation plan, generally known as a "Habitat Conservation Plan" or "HCP." An HCP is a plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect species. The plan usually includes measures to minimize

impacts, such as provisions for permanently protecting land, restoring habitat, and relocating plants or animals to another area.

6.2) Jurisdictional Waters and Wetlands

Three agencies generally regulate activities within streams, wetlands, and riparian areas in California: (1) the U.S. Army Corps of Engineers (USACE) regulates activities under Section 404 of the federal Clean Water Act; (2) the Regional Water Quality Control Board (RWQCB) regulates activities under Section 401 of the federal Clean Water Act and the State Porter-Cologne Water Quality Control Act; and (3) the California Department of Fish and Wildlife (CDFW) regulates activities under California Fish and Game Code Sections 1600-1616.

6.2.1) Federal Clean Water Act, Section 404

Section 404 of the federal Clean Water Act applies to "Waters of the United States" (WoUS). By definition these include waterways that could be used for interstate commerce and their tributaries, including any waters that flow into traditional navigable waters. In non-tidal waters, the limits of jurisdiction are "ordinary high water marks" (OHWM) such as stream banks.

There have been recent changes to the definition of WoUS and the agencies are interpreting WoUS consistent with the pre-2015 regulatory regime until further notice. Under this rule, WoUS includes:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters including interstate wetlands;

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

    a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

    b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

c. Which are used or could be used for industrial purposes by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States under this definition;

5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;

6. The territorial sea;

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Final determination and delineation of federal jurisdiction is made by the USACE and not by the project biologists. Therefore, fieldwork and documentation of the site conditions are done as a preliminary delineation until the USACE reviews and concurs with the results.

6.2.2) Federal Clean Water Act, Section 401 and Porter-Cologne

The RWQCB has jurisdiction over wetlands, WoUS, and Waters of the State under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne) under the California Water Code (§ 13000, et seq.) Permitting is required for activities that will result in a discharge of soils, nutrients, chemicals, detrital materials, or other pollutants into WoUS, Waters of the State, or adjacent wetlands that will affect the water quality of those bodies and the watershed.

6.2.3) California Fish and Game Code, Section 1600

The CDFW, through provisions of the California Fish and Game Code (Sections 1600-1616), is empowered to issue agreements ("Lake and Streambed Alteration Agreements") for projects that will adversely affect wildlife habitat associated with any river, stream, or lake edges. The Lake and Streambed Alteration Agreement will typically include required measures to mitigate impacts.

Sections 1600-1616 of the California Fish and Game Code apply to stream channels, defined elsewhere in the Code as follows:

"A stream is a body of water that flows at least periodically through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

The state definition does not specify a flow rate or inundation frequency and provides no clear distinction between jurisdictional and non-jurisdictional lands.

While the federal USACE criteria (hydrology, soils, and vegetation) are used to evaluate the presence or absence of wetlands within the project site, the determination of state wetland status is not based on the combined presence of the three criterion because the state can take jurisdiction of any one of the three: (1) the presence of open water or saturated soils, (2) presence of vegetation including riparian or wetland species, and/or (3) water-modified or oxygen-depleted soils.

6.3) California Endangered Species Act

California Endangered Species Act (CESA) definitions of endangered and threatened species parallel those defined in the FESA. The CESA defines an endangered species as ". . . a native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes including loss of habitat, change in habitat, over exploitation, predation, competition or disease." Endangered species are in serious danger of becoming extinct and threatened species are likely to become endangered species in the foreseeable future (according to Sections 2062 and 2067, respectively, of the California Fish and Wildlife Code). Candidate species are those under formal review by the CDFW for listing as endangered or threatened (Section 2067). Prior to being considered for protected status, the CDFW designates a species as being of special concern. Species of Special Concern are those for which the CDFW has information indicating population decline.

6.4) California Environmental Quality Act

The California Environmental Quality Act (CEQA) and CEQA Guidelines (§ 15000 et seq.) require identification of environmental effects from discretionary projects. Significant effects are to be mitigated by avoidance, minimization, rectification, or compensation whenever possible.

Effects to all state and federal listed species are considered significant under CEQA. In addition to formally listed species, CEQA considers effects to species that are demonstrably endangered or rare as important or significant. These definitions can include state designated species of

special concern, federal candidate and proposed species, California Natural Diversity Database (CNDDB) tracked species, and California Rare Plant Rank (CRPR) 1B and 2 plants.

Appendix G of the CEQA Guidelines specifically addresses biological resources and encompasses a broad range of resources to be considered.

6.5) California Natural Diversity Database

The California Natural Diversity Database (CNDDB) is a database that ranks overall condition of listed and special status species and sensitive vegetation communities on global (throughout its range) and state (within California) levels. The CNDDB includes documented occurrences of listed and special status species that have been reported to CDFW. State ranking is numerical, ranging from one to five (S1 to S5), with one indicating very few remaining individuals or little remaining habitat and five indicating a demonstrably secure to ineradicable population condition. State ranks (S ranks) may also include an extension (e.g., S1.x) indicating current threats ranging from one (very threatened) to three (no current threats known).

6.6) California Rare Plant Rank

The California Native Plant Society (CNPS) Inventory of Rare and Endangered Species includes documented occurrences of special status plant species that are available through the Consortium of California Herbaria and other sources. The CNPS, in coordination with CDFW, has cataloged California's rare and endangered plants into lists according to population distributions and viability. These lists are numbered and indicate the following California Rare Plant Ranks (CRPR): (1A) presumed extinct in California; (1B) rare, threatened, or endangered throughout their range; (2A) presumed extirpated in California, but more common in other states; (2B) threatened or endangered in California, but more common in other states; (3) more information is needed to establish rarity; and (4) plants of limited distribution in California (i.e., naturally rare in the wild), but whose populations do not appear to be susceptible to threat. A CRPR may also have an extension (e.g., 1B.x) that indicates current level of threat: seriously threatened (x.1), moderately threatened (x.2), or not very threatened (x.3).

6.7) Information for Planning and Consultation

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) is a database that includes federally listed endangered or threatened species and species proposed for listing, designated critical habitat, Birds of Conservation Concern, and other federally regulated lands and biological resources.

6.8) Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711) is an international treaty that made it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Executive Order 13186 ensures that environmental analyses of federal actions required by the National Environmental Policy Act (NEPA) or other established environmental review processes evaluate the effects of actions on migratory birds, with emphasis on species of concern. Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) or loss of habitat upon which the birds depend could be considered "take."

6.9) California Fish and Game Code, Sections 3503 and 3513

California Fish and Game Code Section 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; Section 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and Section 3513 provides for the adoption of the provisions of the federal Migratory Bird Treaty Act, described above.

6.10) Western Riverside County Multiple Species Habitat Conservation Plan

The County of Riverside, including eight (8) additional land jurisdictions and 14 cities, have prepared a Multiple Species Habitat Conservation Plan (MSHCP) for western Riverside County. The MSHCP will build upon existing preserves and provide connectivity and wildlife corridors throughout the region. The MSHCP proposes to conserve approximately 500,000 acres and 146 different species.

The MSHCP was approved by the county on June 17, 2003 and an Implementation Agreement (IA) between the USFWS, the CDFW, and the County was executed and an associated USFWS Section 10(a)(1)(B) Permit (No. TE-088609) was issued on June 22, 2004. The permit grants take authorization for certain species identified in the permit as "Covered Species Adequately Conserved."

The MSHCP establishes seven (7) core reserve areas and associated linkages between proposed and existing core areas. The MSHCP divides these areas into Cells using USGS coordinates.

Focused surveys are required for species identified as not adequately conserved under the MSHCP if suitable habitat is present onsite. If focused surveys are determined necessary and species identified as not adequately conserved under the MSHCP occur onsite, the proponent may be required to undergo a Habitat Acquisition and Negotiation Strategy (HANS) determination with the County of Riverside. If a single-family home or mobile home is to be placed on an existing legal lot, permitting will be reviewed according to the procedures outlined in MSHCP Section 6.1.1, *Expedited Review Process for Single-Family Homes or Mobile Homes to Be Located on an Existing Lot within the Criteria Area*.

MSHCP Section 6.1.2 (Riparian/Riverine Habitat)

Section 6.1.2 of the MSHCP requires an assessment of the potentially significant effects of the proposed project on Riparian/riverine areas, and vernal pools as currently required by CEQA using available information augmented by project-specific mapping. Riparian/riverine areas and vernal pools are defined as follows:

- Riparian/riverine Areas are lands that have flow for all or a portion of the year and which contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year.

- Vernal pools are seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. The determination that an area exhibits vernal pool characteristics, and the definition of the watershed supporting vernal pool hydrology, must be made on a case-by case basis. Such determinations should consider the length of the time the area exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soils, and drainage characteristics, uses, to which it has been subjected, and weather and hydrologic records.

With the exception of wetlands created for the purpose of providing wetlands habitat or resulting from human actions to create open waters or from the alteration of natural stream courses, areas demonstrating characteristics as described above which are artificially created are not included in these definitions.

Burrowing Owl

Section B (Species Accounts) of Volume 2 of the MSHCP (Dudek 2003) lists the following objectives for burrowing owl conservation/protection:

Objective 1

Include within the MSHCP Conservation Area at least 27,470 acres of suitable primary habitat for the burrowing owl including grasslands.

Objective 2

Include within the MSHCP Conservation Area at least 5 Core Areas and interconnecting linkages. Core areas may include the following: (1) Lake Skinner/Diamond Valley Lake area (Existing Core C plus Proposed Extension of Existing Cores 5, 6, 7; 29,060 acres); (2) playa west of Hemet (Proposed Noncontiguous Habitat Block 7; 1,250 acres); (3) San Jacinto Wildlife Area/Mystic Lake area including Lake Perris area (Existing Core H; 17,470 acres); (4) Lake Mathews (Existing Core C plus Proposed Extension of Existing Cores 2; 23,710 acres); and (5) along the Santa Ana River (9,670 acres). The Core Areas should support a combined total breeding population of approximately 120 burrowing owls with no fewer than five pairs in any one Core area.

Objective 3

Include within the MSHCP Conservation Area at least 22,120 acres of suitable secondary habitat for the burrowing owl including playas and vernal pools, and agriculture outside of the Core Areas identified above. Areas where additional suitable habitat could be conserved include west of the Jurupa Mountains, near Temescal Wash (i.e., vicinity of Alberhill), near Temecula Creek, within the Lakeview Mountains, Banning, the Badlands, Gavilan Hills, and Quail Valley.

Objective 4

Include within the MSHCP Conservation Area the known nesting locations of the burrowing owl at Lake Perris, Mystic Lake/San Jacinto Wildlife area, Lake Skinner area, the area around Diamond Valley Lake, playa west of Hemet, Lakeview Mountains, Lake Mathews/Estelle Mountain Reserve and Sycamore Canyon Regional Park.

Objective 5

Surveys for burrowing owl will be conducted as part of the project review process for public and private projects within the burrowing owl survey area where suitable habitat is present (see Burrowing Owl Survey Area Map, Figure 6-4 of the MSHCP, Volume I). The locations of this species determined as a result of survey efforts shall be conserved in accordance with procedures described within Section 6.3.2, MSHCP, Volume I and the guidance provided below:

Burrowing owl surveys shall be conducted utilizing accepted protocols as follows. If burrowing owls are detected on the project site then the action(s) taken will be as follows:

If the site is within the Criteria Area, then at least 90 percent of the area with long-term conservation value will be included in the MSHCP Conservation Area. Otherwise:

1) If the site contains, or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and the surrounding area supports fewer than 3 pairs of burrowing owls, then the on-site burrowing owls will be passively or actively relocated following accepted protocols.

2) If the site (including adjacent areas) supports three or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs will be conserved onsite.

The survey and conservation requirements stated in this objective will be eliminated when it is demonstrated that Objectives 1 – 4 have been met.

Objective 6

Pre-construction presence/absence surveys for burrowing owl within the survey area where suitable habitat is present will be conducted for all Covered Activities through the life of the permit. Surveys will be conducted within 30 days prior to disturbance. Take of active nests will be avoided. Passive relocation (use of one-way doors and collapse of burrows) will occur when owls are present outside the nesting season.

Objective 7

Translocation sites for the burrowing owl will be created in the MSHCP Conservation Area for the establishment of new colonies. Translocation sites will be identified, taking into consideration unoccupied habitat areas, presence of burrowing mammals to provide suitable burrow sites, existing colonies and effects to other Covered Species. Reserve Managers will consult with the Wildlife Agencies regarding site selection prior to translocation site development.

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APPENDIX A: PLANT AND WILDLIFE SPECIES

Plant and wildlife species identified on the Golden Meadows site during surveys from 2003 to 2021. One asterisk (*) indicates a non-native species; two asterisks (**) indicates a special status species; a question mark (?) indicates uncertainty regarding identification or native status. The list includes common butterfly species that were observed during Quino checkerspot butterfly surveys in 2004 but does not represent a complete inventory of insects present.

	Scientific Name	**Common Name**
	VASCULAR PLANTS	
	DICOTYLEDONS	
	ADOXACEAE	MUSKROOT FAMILY
	Sambucus nigra ssp. cerulea (S. mexicana)	Mexican elderberry, blue elderberry
	AMARANTHACEAE	AMARANTH FAMILY
*	*Amaranthus albus*	Tumbleweed, tumbling pigweed
	ANACARDIACEAE	SUMAC or CASHEW FAMILY
*	*Schinus molle*	Peruvian pepper tree
	APIACEAE	CELERY FAMILY
	Daucus pusillus	Rattlesnake weed, wild carrot
	ASTERACEAE	ASTER FAMILY
	Acourtia microcephala (Perezia microcephala)	Scapellote, perezia
	Ambrosia acanthicarpa	Annual bur-sage, annual sandbur
*	*Anthemis cotula*	Mayweed, dog mayweed
	Artemisia californica	California sagebrush
	Baccharis salicifolia (B. glutinosa)	Mulefat
	Bebbia juncea	Sweetbush
*	*Centaurea melitensis*	Tocalote
	Chaenactis artemisiifolia	White pincushion, wormwood pincushion
	Corethrogyne filaginifolia var. filaginifolia (Lessingia filaginifolia)	California-aster, sand-aster
	Deinandra fasciculata (Hemizonia fasciculata)	Fascicled tarplant, slender tarweed
	Encelia farinosa	Brittlebush
*	*Erigeron bonariensis (Conyza bonariensis)*	Flax-leaved horseweed
	Erigeron canadensis (Conyza canadensis)	Horseweed, mare's tail
	Eriophyllum confertiflorum	Golden-yarrow

	Scientific Name	**Common Name**
	Eriophyllum multicaule	Many-stem woolly daisy
	Gutierrezia californica (G. bracteata)	California matchweed
	Helianthus annuus	Western sunflower
	Helianthus gracilentus	Slender sunflower
*	*Lactuca serriola*	Prickly lettuce
	Lasthenia californica (L. chrysostoma)	California goldfields
	Layia platyglossa	Tidy-tips
	Logfia filaginoides (Filago californica)	California filago
*	*Matricaria discoidea (Chamomilla suaveolens, M. matricarioides)*	Pineapple weed
*	*Oncosiphon pilulifer (Matricaria globosa)*	Stinknet
	Rafinesquia californica	California chicory
*	*Senecio vulgaris*	Common groundsel
*	*Sonchus oleraceus*	Common sow thistle
	Stephanomeria virgata	Wreath plant
	Stylocline gnaphaloides	Everlasting neststraw
	Tetradymia comosa	Hairy horsebrush, common-thorn
	Uropappus lindleyi (Microseris lindleyi, M. linearifolia)	Silverpuffs
*?	*Xanthium spinosum*	Spiny cocklebur
	BORAGINACEAE	BORAGE OR WATERLEAF FAMILY
	Amsinckia intermedia (A. menziesii var. intermedia)	Large flower rancher's fiddleneck
	Cryptantha species	Unid. cryptantha
	Cryptantha intermedia	Common cryptantha
	Heliotropium curassavicum	Wild heliotrope
	Pectocarya linearis	Slender pectocarya
	Phacelia minor	Wild Canterbury bells
	Phacelia ramosissima	Branching phacelia
	Plagiobothrys species	Popcornflower
	BRASSICACEAE	MUSTARD FAMILY
*	*Brassica nigra*	Black mustard
*	*Hirschfeldia incana (Brassica geniculata)*	Shortpod mustard
	Lepidium nitidum	Shining peppergrass
*	*Raphanus sativus*	Wild radish
*	*Sisymbrium irio*	London rocket
*	*Sisymbrium orientale*	Wild mustard, hare's ear cabbage
	Thysanocarpus curvipes	Fringepod

	Scientific Name	**Common Name**
	CACTACEAE	CACTUS FAMILY
	Cylindropuntia californica var. parkeri (Opuntia parryi)	Valley cholla
	CHENOPODIACEAE	GOOSEFOOT FAMILY
*	*Atriplex suberecta*	Sprawling saltbush, Australian saltbush
*	*Chenopodium murale*	Nettle-leaved goosefoot, lamb's quarters
*	*Salsola tragus*	Russian thistle
	CONVOLVULACEAE	MORNING-GLORY FAMILY
	Calystegia macrostegia	Morning-glory
	Cuscuta californica	Chaparral dodder, witch's hair
	CRASSULACEAE	STONECROP FAMILY
	Crassula connata (C. erecta)	Pygmy-weed, pygmy stonecrop
	CUCURBITACEAE	GOURD FAMILY, CUCUMBER FAMILY
	Cucurbita foetidissima	Calabazilla
	Marah macrocarpa	Chilicothe, wild cucumber
	EUPHORBIACEAE	SPURGE FAMILY
	Croton setiger (C. setigerus, Eremocarpus setiger, E. setigerus)	Turkey-mullein, doveweed
	Euphorbia albomarginata (Chamaesyce albomarginata)	Rattlesnake sandmat, rattlesnake weed
	FABACEAE	LEGUME FAMILY, PEA FAMILY
	Acmispon americanus (Lotus purshianus, L. unifoliatus)	"Spanish" clover
	Acmispon glaber (Lotus scoparius)	Deerweed
	Lupinus species	Unid. lupine
	Lupinus bicolor	Miniature lupine, dove lupine
*	*Medicago polymorpha*	California burclover
*	*Vicia villosa*	Winter vetch
	FAGACEAE	OAK FAMILY
	Quercus agrifolia	Coast live oak
	GERANIACEAE	GERANIUM FAMILY
*	*Erodium botrys*	Long-beak filaree
*	*Erodium cicutarium*	Redstem filaree
	JUGLANDACEAE	WALNUT FAMILY
**	*Juglans californica*	Southern California black walnut

	Scientific Name	**Common Name**
	LAMIACEAE	MINT FAMILY
*	*Lamium amplexicaule*	Common henbit
*	*Marrubium vulgare*	Horehound
	Salvia apiana	White sage
	Salvia columbariae	Chia
	Salvia mellifera	Black sage
	Trichostema lanceolatum	Vinegar weed
	MALVACEAE	MALLOW FAMILY
*	*Malva parviflora*	Cheeseweed
	MYRSINACEAE	MYRSINE FAMILY
*	*Lysimachia (Anagallis) arvensis*	Scarlet pimpernel
	MYRTACEAE	MYRTLE FAMILY, EUCALYPTUS FAMILY
*	*Eucalyptus species*	Ornamental eucalyptus, gumtree
	NYCTAGINACEAE	FOUR O'CLOCK FAMILY
	Mirabilis laevis var. crassifolia (M. californica)	Wishbone bush
	ONAGRACEAE	EVENING-PRIMROSE FAMILY
	Camissonia species	Unid. evening-primrose
	Eulobus californica (Camissonia californica)	California false mustard, mustard evening primrose
	PAPAVERACEAE	POPPY FAMILY
	Eschscholzia californica	California poppy
	PHRYMACEAE	LOPSEED FAMILY
	Diplacus (Mimulus) aurantiacus (M. puniceus, M. longiflorus)	Bush monkeyflower, sticky monkeyflower
	Erythranthe (Mimulus) guttatus	Seep monkeyflower
	PLANTAGINACEAE	PLANTAIN FAMILY
	Antirrhinum nuttallianum	Nuttall snapdragon, violet snapdragon
	Keckiella antirrhinoides	Yellow bush-penstemon
	Plantago erecta	California plantain
	POLEMONIACEAE	PHLOX FAMILY
	Eriastrum sapphirinum	Sapphire woollystar
	Navarretia hamata	Hooked navarretia
	POLYGONACEAE	BUCKWHEAT FAMILY
	Chorizanthe fimbriata	Fringed spineflower
**	*Chorizanthe polygonoides var. longispina*	Long-spined spineflower
	Eriogonum fasciculatum var. foliolosum	Leafy California wild buckwheat, interior California buckwheat

	Scientific Name	**Common Name**
	Eriogonum fasciculatum var. polifolium	Mojave Desert California buckwheat
*	*Polygonum aviculare (P. arenastrum)*	Common knotweed
*	*Rumex crispus*	Curly dock
	PORTULACACEAE	PURSLANE FAMILY
*	*Portulaca oleracea*	Common purslane
	ROSACEAE	ROSE FAMILY
	Adenostoma fasciculatum	Chamise
	RUBIACEAE	MADDER FAMILY, COFFEE FAMILY
*?	*Galium aparine*	Goose grass, annual bedstraw
	SALICACEAE	WILLOW FAMILY
	Populus fremontii ssp. fremontii	Fremont cottonwood
	Salix gooddingii	Goodding's black willow
	Salix lasiolepis	Arroyo willow
	SCROPHULARIACEAE	FIGWORT FAMILY, SNAPDRAGON FAMILY
	Scrophularia californica	California figwort, coast figwort
	SOLANACEAE	NIGHTSHADE FAMILY
	Datura wrightii (D. meteloides)	Jimsonweed, tolguacha
*	*Nicotiana glauca*	Tree tobacco
	Solanum americanum (S. nodiflorum)	White nightshade
	TAMARICACEAE	TAMARISK FAMILY
*	*Tamarix species*	Unid. tamarisk
	URTICACEAE	NETTLE FAMILY
*	*Urtica urens*	Dwarf nettle
	ZYGOPHYLLACEAE	CALTROP FAMILY
*	*Tribulus terrestris*	Puncture vine
	MONOCOTYLEDONS	
	AGAVACEAE	CENTURY PLANT FAMILY, AGAVE FAMILY
	Hesperoyucca whipplei (Yucca whipplei)	Chaparral yucca
	LILIACEAE	LILY FAMILY
	Calochortus splendens	Splendid mariposa lily
	POACEAE	GRASS FAMILY
*	*Avena barbata*	Slender wild oat
*	*Avena fatua*	Wild oat

	Scientific Name	**Common Name**
*	*Bromus species*	Non-native brome
*	*Bromus diandrus (B. rigidus)*	Ripgut brome
*	*Bromus rubens (B. madritensis ssp. rubens)*	Red brome
*	*Digitaria sanguinalis*	Hairy crabgrass
*	*Festuca species (Vulpia species)*	Annual fescue
*	*Hordeum murinum*	Wall barley, hare barley
*	*Lamarckia aurea*	Goldentop grass
*	*Phalaris species*	Unid. canary grass
*	*Schismus barbatus*	Mediterranean grass
*	*Triticum aestivum*	Wheat
	THEMIDACEAE	BRODIAEA FAMILY
	Dichelostemma capitatum (D. pulchella, Brodiaea pulchella)	Blue dicks, wild hyacinth
	Muilla maritima	Common muilla, rough muilla

	Scientific Name	**Common Name**
	VERTEBRATES	
	Reptiles	
	Colubridae	Colubrid Snakes
	Pituophis catenifer	Gopher snake
	Phrynosomatidae	Spiny Lizards
**	*Phrynosoma blainvillii*	Coast horned lizard
	Sceloporus occidentalis	Western fence lizard
	Sceloporus orcutti	Granite spiny lizard
	Uta stansburiana	Side-blotched lizard
	Teiidae	Teiid Lizards
**	*Aspidoscelis hyperythra*	Orange-throated whiptail
**	*Aspidoscelis tigris stejnegeri*	Coastal (western) whiptail
	Birds	
	Accipitridae	Hawks, Eagles, and Harriers
**	*Accipiter cooperii*	Cooper's hawk
	Buteo jamaicensis	Red-tailed hawk
	Buteo lineatus	Red-shouldered hawk
**	*Circus hudsonius (C. cyaneus)*	Northern harrier
**	*Elanus leucurus*	White-tailed kite
	Aegithalidae	Long-tailed Tits
	Psaltriparus minimus	Bushtit
	Alaudidae	Larks
**	*Eremophila alpestris actia*	California horned lark
	Anatidae	Ducks, Geese, Swans
	Anas platyrhynchos	Mallard (fly over)
	Apodidae	Swifts
	Aeronautes saxatalis	White-throated swift
	Ardeidae	Herons
**	*Ardea alba*	Great egret
**	*Ardea herodias*	Great blue heron (fly over)
	Cardinalidae	Cardinals
	Passerina amoena	Lazuli bunting
	Cathartidae	Vultures
	Cathartes aura	Turkey vulture

Charadriidae		Plovers
	Charadrius vociferus	Killdeer
Columbidae		Pigeons and Doves
*	*Columba livia*	Rock dove, common pigeon
	Zenaida macroura	Mourning dove
Corvidae		Crows and Jays
	Aphelocoma californica	California scrub jay
	Corvus brachyrhynchos	American crow
	Corvus corax	Common raven
Cuculidae		Cuckoos
	Geococcyx californianus	Greater roadrunner
Falconidae		Falcons
	Falco sparverius	American kestrel
Fringillidae		Finches
**	*Spinus (Carduelis) lawrencei*	Lawrence's goldfinch
	Spinus (Carduelis) psaltria	Lesser goldfinch
	Spinus (Carduelis) tristes	American goldfinch
	Haemorhous (Carpodacus) mexicanus	House finch
Hirundinidae		Swallows
	Hirundo rustica	Barn swallow
	Petrochelidon pyrrhonota tachina	Cliff swallow
	Stelgidopteryx serripennis	Northern rough-winged swallow
	Tachycineta thalassina	Violet-green swallow
Icteridae		Blackbirds
	Agelaius phoeniceus	Red-winged blackbird
	Euphagus cyanocephalus	Brewer's blackbird
	Icterus bullockii	Bullock's oriole
	Sturnella neglecta	Western meadowlark
Laniidae		Shrikes
**	*Lanius ludovicianus*	Loggerhead shrike
Mimidae		Mockingbirds
	Mimus polyglottos	Northern mockingbird
**	*Toxostoma redivivum*	California thrasher
Motacillidae		Wagtails and Pipits
	Anthus rubescens	American pipit
Odontophoridae		Quail
	Callipepla californica	California quail

Parulidae		Wood Warblers
	Geothlypis tolmiei	MacGillivray's warbler
	Oreothlypis celata	Orange-crowned warbler
	Setophaga coronata	Yellow-rumped warbler
Passerellidae		New World Sparrows
**	*Aimophila ruficeps canescens*	Southern California rufous-crowned sparrow
**	*Artemisiospiza belli*	Bell's sage sparrow
	Chondestes grammacus	Lark sparrow
	Melospiza melodia	Song sparrow
	Melozone crissalis	California towhee
	Passerculus sandwichensis	Savannah sparrow
	Pipilo maculatus	Spotted towhee
	Pooecetes gramineus	Vesper sparrow
	Spizella passerina	Chipping sparrow
	Zonotrichia leucophrys	White-crowned sparrow
Passeridae		Old World Sparrows
*	*Passer domesticus*	House sparrow
Picidae		Woodpeckers
	Colaptes auratus	Northern flicker
**	*Dryobates (Picoides) nuttallii*	Nuttall's woodpecker
Polioptilidae		Gnatcatchers
	Polioptila caerulea	Blue-gray gnatcatcher
**	*Polioptila californica*	Coastal California gnatcatcher
Strigidae		Owls
**	*Athene cunicularia*	Burrowing owl
Sturnidae		Starlings
*	*Sturnus vulgaris*	European starling
Timaliidae		Babblers
**	*Chamaea fasciata*	Wrentit
Trochilidae		Hummingbirds
	Calypte anna	Anna's hummingbird
**	*Calypte costae*	Costa's hummingbird
**	*Selasphorus rufus*	Rufous hummingbird
Troglodytidae		Wrens
	Catherpes mexicanus	Canyon wren
	Salpinctes obsoletus	Rock wren
	Thryomanes bewickii	Bewick's wren
	Troglodytes aedon	House wren
Turdidae		Thrushes
	Sialia mexicana	Western bluebird

Tyrannidae	Tyrant Flycatchers
Empidonax wrightii	Gray flycatcher
Myiarchus cinerascens	Ash-throated flycatcher
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Tyrannus verticalis	Western kingbird
Tyrannus vociferans	Cassin's kingbird

Mammals

Canidae	Dogs, Foxes, and Coyotes
Canis familiaris	Domestic dog
Canis latrans	Coyote
Geomyidae	Pocket Gophers
Thomomys bottae	Botta's pocket gopher (sign)
Leporidae	Rabbits
** *Lepus californicus bennettii*	San Diego black-tailed jackrabbit
Sylvilagus audubonii	Audubon's cottontail
Sciuridae	Squirrels
Spermophilus beecheyi	California ground squirrel

INVERTEBRATES

Lepidoptera	**Butterflies and Moths**
Papilionidae	Swallowtails
Papilio rutulus	Western tiger swallowtail
Papilio zelicaon	Anise swallowtail
Nymphalidae	Brush-footed butterflies
Euphydryas chalcedona	Chalcedon checkerspot
Junonia coenia	Buckeye
Vanessa cardui	Painted lady
Vanessa annabella	West coast lady
Vanessa virginiensis	Virginia lady
Lycaenidae	Blues, Hairstreaks, Coppers
Glaucopsyche lygdamus australis	Southern blue
Icaricia acmon	Acmon blue
Pieridae	Whites and Sulfurs
Anthocharis sara	Sara orange-tip
Anthocharis cethura	Felder's orange-tip
Pontia protodice	Checkered white

Riodinidae	Metalmarks
Apodemia mormo virgulti	Behr's metalmark
Hesperiidae	Skippers
Erynnis funeralis	Funereal duskywing
Pyrgus communis albescens	Small checkered skipper

APPENDIX B: SPECIAL STATUS SPECIES POTENTIALS FOR OCCURRENCE

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Plants				
Abronia villosa var. aurita Chaparral sand-verbena	Annual herb. Sandy soils in chaparral, coastal scrub, desert dunes at 75-1600m elevation. Riverside, San Bernardino, Imperial, San Diego, Orange Cos. (presumed extirpated in Orange Co.), Arizona, Baja.	(Jan)Mar-Sep	Fed: None Calif: S2 CRPR: 1B.1	Low; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Allium marvinii Yucaipa onion	Perennial bulbiferous herb. Clay soils in openings in chaparral at 760-1065m. Riverside, San Bernardino, Orange, San Diego Cos.	Apr-May	Fed: None Calif: S1 CRPR: 1B.2 MSHCP: AC b USFS: S	Not expected; potentially suitable habitat, below elevation range, no documented occurrences within 5 mi., not observed during surveys.
Allium munzii Munz's onion	Perennial bulbiferous herb. Mesic, clay soils in chaparral, cismontane woodland, coastal scrub, pinyon juniper woodland, valley and foothill grassland at 297-1070m elevation. Western Riverside Co.	Mar-May	Fed: END Calif: THR, S1 CRPR: 1B.1 MSHCP: AC b	Low; no or marginal habitat, three documented occurrences within 5 mi. (from 1897, Menifee area – exact location unknown, mapped 4.5 mi. NE of site; 1962, exact location unknown, mapped 2.7 mi. NW; from 2015, 2.5 mi. SE), not observed during surveys.
Almutaster pauciflorus Alkali marsh aster	Perennial herb. Alkaline soils in meadows and seeps at 240 to 800m elevation. Inyo, Kern, Riverside, and San Bernardino Cos., SW and North-Central US, and Mexico.	Jun-Oct	Fed: None Calif: S1S2 CRPR: 2B.2	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Ambrosia pumila San Diego ambrosia	Perennial rhizomatous herb. Sandy or clay soils, often in disturbed areas, sometimes alkaline. Chaparral, coastal scrub, valley and foothill grassland, and vernal pools at 20-415m elevation. Riverside, San Diego Co., Baja.	Apr-Oct	Fed: END Calif: S1 CRPR: 1B.1 MSHCP: AC b	Not expected; potentially suitable habitat, above elevation range, no documented occurrences within 5 mi., not observed during surveys.
Amsinckia douglasiana Douglas' fiddleneck	Annual herb. Monterey shale, dry soils in cismontane woodland, valley and foothill grassland at sea level to 1950m elevation. Central coast of CA, few observations in southern CA. Not tracked in the CNDDB.	Mar-May	Fed: None Calif: S4 CRPR: 4.2	Not expected; no or marginal habitat, no mapped CCH records within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Arctostaphylos rainbowensis Rainbow manzanita	Perennial evergreen shrub. Chaparral at 205-670m elevation. Riverside and San Diego Cos.	Dec-Mar	Fed: None Calif: S2 CRPR: 1B.1 MSHCP: AC BLM: S USFS: S	Absent; potentially suitable habitat, no documented occurrences within 5 mi., conspicuous plant not observed during surveys.
Astragalus pachypus var. jaegeri Jaeger's milk-vetch	Perennial shrub. Sandy or rocky soils in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland at 365-975m elevation. Riverside and San Diego Cos.	Dec-Jun	Fed: None Calif: S1 CRPR: 1B.1 MSHCP: AC USFS: S BLM: S	Low; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Atriplex coronata var. notatior San Jacinto Valley crownscale	Annual herb. Alkaline soils in playas, mesic areas of valley and foothill grassland, vernal pools at 139-500m elevation. Western Riverside Co.	Apr-Aug	Fed: END Calif: S1 CRPR: 1B.1 MSHCP: AC d	Not expected; no suitable habitat, no documented occurrences within 5 mi. not observed during surveys.
Atriplex parishii Parish's brittlescale	Annual herb. Alkaline soils in chenopod scrub, playas, vernal pools at 25-1900m elevation; Riverside, San Bernardino, LA, Orange, and San Diego Cos. and Baja. Presumed extirpated in LA, Orange, and San Bernardino Cos.	Jun - Oct	Fed: None Calif: S1 CRPR: 1B.1 MSHCP: AC d USFS: S	Not expected; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Atriplex serenana var. davidsonii Davidson's saltscale	Annual herb. Alkaline soils in coastal bluff scrub, coastal scrub at 10-200m elevation; Channel Islands, LA, Orange, Riverside, San Luis Obispo, Santa Barbara, and Ventura Cos. Presumed extirpated in Santa Barbara Co., possibly extirpated in LA Co.	Apr - Oct	Fed: None Calif: S1 CRPR: 1B.2 MSHCP: AC d	Not expected; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Ayenia compacta California ayenia	Perennial herb. Rocky soils in Mojavean and Sonoran desert scrub at 150-1095m elevation. Riverside, San Bernardino, San Diego Cos., Arizona, Sonora and Baja Mexico.	Mar-Apr	Fed: None Calif: S3 CRPR: 2B.3	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Brodiaea filifolia Thread-leaved brodiaea	Perennial bulbiferous herb. Often on clay soils in chaparral openings, cismontane woodland, coastal scrub, playas, valley and foothill grassland, and vernal pools at 25-1120m elevation. LA, Orange, Riverside, San Bernardino, and San Diego Cos.; scattered in Southern CA foothills & valleys.	Mar-Jun	Fed: THR Calif: END, S2 CRPR: 1B.1 MSHCP: AC d	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Brodiaea santarosae Santa Rosa Basalt brodiaea	Perennial bulbiferous herb. Basalt in valley and foothill grassland. Santa Rosa Plateau, Riverside and San Diego Cos.	May-Jun	Fed: None Calif: S1 CRPR: 1B.2 USFS: S	Absent; no suitable habitat, outside geographic range, no documented occurrences within 5 mi., not observed during surveys.
Calochortus catalinae Catalina mariposa-lily	Perennial bulbiferous herb. Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland at 15-700m elevation. LA, Orange, Riverside, San Bernardino, Santa Barbara, Ventura Co, some Channel Islands. Not tracked in CNDDB.	(Feb)Mar-Jun	Fed: None Calif: S3S4 CRPR: 4.2	Low; potentially suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.
Calochortus plummerae Plummer's mariposa lily	Perennial bulbiferous herb. Granitic rocky soils in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grassland at 100-1700m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Ventura Cos.	May-Jul	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Low; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Calochortus weedii var. intermedius Intermediate mariposa lily	Perennial bulbiferous herb. Rocky, calcareous soils in chaparral, coastal scrub, valley and foothill grassland at 105-855m elevation. LA, Orange, San Bernardino, and western Riverside Co.	May-Jul	Fed: None Calif: S3 CRPR: 1B.2 USFS: S MSHCP: AC	Low; potentially suitable habitat, two documented occurrences within 5 mi. (2003, 3.5 mi. S; 2015, 4.2 mi. SE), not observed during surveys.
Carex buxbaumii Buxbaum's sedge	Perennial rhizomatous herb. Bogs and fens, mesic meadows and seeps, marshes and swamps at 3-3300m elevation. Most of US, northern CA, one occurrence reported near Lake Elsinore in Riverside Co. Not tracked in CNDDB.	Mar-Aug	Fed: None Calif: S3 CRPR: 4.2	Absent; no suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Caulanthus simulans Payson's jewelflower	Annual herb. Chaparral, coastal scrub at 90-2200m elevation. North-facing slopes and ridgelines on sandy-granitic soils, frequently on steep rocky slopes, in burned areas, or disturbed sites such as streambeds. Orange, western Riverside, San Diego Cos.	(Feb)Mar-May(Jun)	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Centromadia pungens ssp. *laevis* Smooth tarplant	Annual herb. Alkaline soils in chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland at 0-640m elevation. Also fallow fields, drainage ditches; mainly in SW Riverside Co., a few sites in interior valleys of LA, San Bernardino, San Diego Cos.	Apr-Sep	Fed: None Calif: S2 CRPR: 1B.1 MSHCP: AC d	Moderate; potentially suitable habitat, 11 documented occurrences within 5 mi. (1999 thru 2021, closest is 0.7 mi. NNW), not observed during surveys.
Chorizanthe leptotheca Peninsular spineflower	Annual herb. Granitic soils and alluvial fans in chaparral, coastal scrub, lower montane coniferous forest at 300-1900m elevation. Riverside, San Bernardino, LA, San Diego, Kern, San Luis Obispo Cos., Baja. Not tracked in the CNDDB.	May-Aug	Fed: None Calif: S3 CRPR: 4.2 MSHCP: AC	Not expected; no or marginal habitat, one mapped CCH record within 5 mi. (1893, mapped 2.1 mi. NE), not observed during surveys.
Chorizanthe parryi var. *parryi* Parry's spineflower	Annual herb. Sandy or rocky soils and openings in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland at 275-1220m elev. LA, Riverside, San Bernardino Cos.	Apr-Jun	Fed: None Calif: S2 CRPR: 1B.1 USFS: S BLM: S MSHCP: AC	Moderate; potentially suitable habitat, 18 documented occurrences within 5 mi. (1998 thru 2017, closest is 0.9 mi. SW), not observed during surveys.
Chorizanthe polygonoides var. longispina Long-spined spineflower	Annual herb. Often on clay soils in chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools at 30-1530m elevation. Orange, Riverside, San Diego Cos., Baja.	Apr-Jul	Fed: None Calif: S3 CRPR: 1B.2 MSHCP: AC	Occurs; observed on site during surveys in 2017.
Clinopodium chandleri San Miguel savory	Perennial shrub. Rocky, gabbroic, or metavolcanic soils in chaparral, cismontane woodlands, coastal scrub, riparian woodland, valley and foothill grassland at 120-1075m elevation. Orange, Riverside, San Diego Co., Baja.	Mar-Jul	Fed: None Calif: S2 CRPR: 1B.2 MSHCP: AC b BLM: S USFS: S	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Convolvulus simulans Small-flowered morning-glory	Annual herb. Clay soils, serpentinite seeps, chaparral openings, coastal scrub, valley and foothill grassland at 30-740m elevation. LA, Orange, Riverside, San Bernardino, San Diego Cos. and Central CA, Baja. Not tracked in CNDDB.	Mar-Jul	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Low to moderate; potentially suitable habitat, nine mapped CCH records within 5 mi. (1991-2018, all about 2.5 mi. SE), not observed during surveys.
Cryptantha wigginsii Wiggins' cryptantha	Annual herb. Coastal scrub at 20-275m elevation, often on clay soils. LA, Riverside, San Diego Cos., Catalina Island, and Baja.	Feb-Jun	Fed: None Calif: S1 CRPR: 1B.2	Not expected; potentially suitable habitat, above elevation range, no documented occurrences within 5 mi., not observed during surveys.
Deinandra (Hemizonia) paniculata Paniculate tarplant	Annual herb. Usually vernally mesic areas, sometimes sandy. Coastal scrub, valley and foothill grassland, vernal pools at 25-940m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Ventura, Kern, Santa Barbara, San Luis Obispo Cos., Baja. Not tracked in the CNDDB.	(Mar) Apr-Nov	Fed: None Calif: S4 CRPR: 4.2	Low; potentially suitable or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Dodecahema leptoceras Slender-horned spineflower	Annual herb. Open, sandy alluvial benches in valleys & canyons. Chaparral, coastal scrub (alluvial fans), cismontane woodland at 200-760m elevation. LA, Riverside, San Bernardino Cos.	Apr-Jun	Fed: END Calif: END, S1 CRPR: 1B.1 MSHCP: AC b	Not expected; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Dudleya multicaulis Many-stemmed dudleya	Perennial herb. Often on clay soils in chaparral, coastal scrub, valley and foothill grassland at 15-790m elevation. LA, Orange, Riverside, San Bernardino, San Diego Cos.	Apr-Jul	Fed: None Calif: S2 CRPR: 1B.2 USFS: S MSHCP: AC b	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Eryngium aristulatum var. parishii San Diego button-celery	Annual/perennial herb. Mesic areas in coastal scrub, valley and foothill grassland, vernal pools at 20-620m elevation. Riverside, LA, Orange, San Diego Cos. and Baja.	Apr-Jun	Fed: END Calif: END, S1 CRPR: 1B.1 MSHCP: AC	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Erythranthe diffusa Palomar monkeyflower	Annual herb. Sandy or gravelly soils in chaparral, lower montane coniferous forest at 1220-1830m elevation. Orange, Riverside, San Diego Co., Baja. Not tracked in the CNDDB.	Apr-Jun	Fed: None Calif: S3 CRPR: 4.3	Absent; no or marginal habitat, well below elevation range, no mapped CCH records within 5 mi., not observed during surveys.
Geothallus tuberosus Campbell's liverwort	Ephemeral liverwort. Grows on soil in mesic coastal scrub, vernal pools at 10-600m elevation. Riverside and San Diego Cos.	Not applicable	Fed: None Calif: S2 CRPR: 1B.1	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Harpagonella palmeri Palmer's grapplinghook	Annual herb. Clay soils and open grassy areas within shrubland in chaparral, coastal scrub, valley and foothill grassland at 20-955m elevation. LA, Orange, Riverside, San Diego Co., Catalina Island, AZ, Baja and Sonora, Mexico.	Mar-May	Fed: None Calif: S3 CRPR: 4.2 MSHCP: AC	Not expected; no or marginal habitat, one documented occurrence within 5 mi. (1981, 2.4 mi. SE), not observed during surveys.
Hesperocyparis forbesii Tecate cypress	Perennial evergreen tree. Clay, gabbroic, or metavolcanic soils in closed-cone coniferous forest, chaparral at 80-1500m elevation. Orange, Riverside, San Diego Co., Baja.	Not applicable	Fed: None Calif: S2 CRPR: 1B.1	Absent; no or marginal habitat, no documented occurrences within 5 mi., conspicuous plant not observed during surveys.
Holocarpha virgata ssp. elongata Graceful (curving) tarplant	Annual herb. Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland at 60-1100m elevation. Orange, Riverside, San Diego Cos. Known in Riverside County only from the Santa Rosa Plateau. Not tracked in CNDDB.	May-Nov	Fed: None Calif: S3 CRPR: 4.2 MSHCP: AC	Not expected; potentially suitable habitat, outside geographic range, no mapped CCH records within 5 mi., not observed during surveys.
Hordeum intercedens Vernal barley	Annual grass. Saline flats and depressions in valley and foothill grassland, vernal pools, coastal dunes, coastal scrub at 5-1000m elevation. LA, Orange, Riverside, San Diego Cos., Central CA, Channel Islands. Not tracked in the CNDDB.	Mar-Jun	Fed: None Calif: S3S4 CRPR: 3.2 MSHCP: AC	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Juglans californica Southern California black walnut	Perennial deciduous tree. Alluvial soils in chaparral, cismontane woodland, coastal scrub, riparian woodland at 50-900m elevation. LA, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, Ventura Cos., Central and Northern CA. Not tracked in CNDDB.	Mar-Aug	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Occurs; observed onsite during surveys.
Juncus acutus ssp. leopoldii Southwestern spiny rush	Perennial rhizomatous herb. Mesic coastal dunes, alkaline seeps, coastal salt marshes at 3-900m elevation. S CA, central coast, AZ, NV, other areas. Not tracked in CNDDB.	(Mar)May-Jun	Fed: None Calif: S4 CRPR: 4.2	Absent; no suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.
Juncus luciensis Santa Lucia dwarf rush	Annual herb. Chaparral, Great Basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools at 300-2040m elevation. Riverside and San Diego Cos., central and northern CA.	Apr-Jul	Fed: None Calif: S3 CRPR: 1B.2 USFS: S	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Lasthenia glabrata spp. coulteri Coulter's goldfields	Annual herb. Coastal salt marshes and swamps, playas, vernal pools at 1-1220m elevation. Riverside, San Bernardino, LA, Orange, Ventura Cos., Central and Northern CA, Baja. Presumed extirpated in LA, San Bernardino Cos.	Feb-Jun	Fed: None Calif: S2 CRPR: 1B.1 BLM: S MSHCP: AC d	Absent; no suitable habitat, three documented occurrences within 5 mi. (2003, 1.7 mi. N, appears to be developed; 2011, 3.3 mi. SE; 2015, 2.7 mi. NW), not observed during surveys.
Lathyrus splendens Pride-of-California	Perennial herb. Chaparral at 200-1525m elevation. LA, Riverside, San Bernardino Cos., Baja. Not tracked in CNDDB.	Mar-Jun	Fed: None Calif: S4 CRPR: 4.3	Not expected; potentially marginal habitat, no mapped CCH records within 5 mi., not observed during surveys.
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	Annual herb. Chaparral, coastal scrub at 1-885m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Ventura, Santa Barbara, Mono Cos., Channel Islands, Baja.	Jan-Jul	Fed: None Calif: S3 CRPR: 4.3	Low; potentially suitable habitat, two documented occurrences within 5 mi. (2006, 2.0 mil SSW; 2008, 3.3 mi. N), not observed during surveys.
Lilium humboldtii ssp. ocellatum Ocellated Humboldt lily	Perennial bulbiferous herb. Openings in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, riparian woodland at 30-1800m elevation. LA, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, Ventura Co, some Channel Islands. Lower stream benches in riparian corridors in lower montane coniferous forest and coastal chaparral or shaded, dry slopes beneath a dense oak or conifer canopy.	Mar-Jul(Aug)	Fed: None Calif: S4? CRPR: 4.2 MSHCP: NAC f	Absent; no suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.
Lilium parryi Lemon lily	Perennial bulbiferous herb. Mesic soils in upper and lower montane coniferous forest, riparian forest, meadows and seeps at 1220-2745m elevation. LA, Riverside, San Bernardino, San Diego Co, Arizona, Sonora Mex.	Jul-Aug	Fed: None Calif: S3 CRPR: 1B.2 USFS: S MSHCP: NAC f	Absent; no suitable habitat, well below elevation range, no documented occurrences within 5 mi., not observed during surveys.
Limnanthes alba ssp. parishii Parish's meadowfoam	Annual herb. Vernally mesic areas in lower montane coniferous forest, meadows and seeps, vernal pools at 600-2000m elevation. Riverside and San Diego Cos.	Apr-Jun	Fed: None Calif: END, S2 CRPR: 1B.2 USFS: S BLM: S MSHCP: AC	Absent; no suitable habitat, below elevation range, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Microseris douglasii ssp. platycarpha Small-flowered microseris	Annual herb. Clay soils in cismontane woodland, coastal scrub, valley and foothill grassland, vernal pools at 15-1070m elevation. LA, Orange, Riverside, San Diego Cos., Channel Islands, Baja. Not tracked in CNDDB.	Mar-May	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Low; potentially suitable habitat, eight mapped CCH records within 5 mi. (2000, 1.5 mi. N, 1996, 2.7 mi. WSW; 1992-2015, all about 2.5 mi. SE), not observed during surveys.
Monardella hypoleuca ssp. intermedia Intermediate monardella	Perennial rhizomatous herb. Chaparral, cismontane woodlands, sometimes lower montane coniferous forest at 400-1250m elevation. Orange, Riverside, San Diego Co.	Apr-Sep	Fed: None Calif: S2? CRPR: 1B.3	Not expected; potentially marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Myosurus minimus ssp. apus Little mousetail	Annual herb. Valley and foothill grasslands, alkaline vernal pools at 20-640m elevation. Riverside, San Bernardino, San Diego Cos., Central and Northern CA, Oregon, Baja.	Mar-Jun	Fed: None Calif: S2 CRPR: 3.1 MSHCP: AC d	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Nama stenocarpa Mud nama	Annual/perennial herb. Found in marshy habitat on lake margins and riverbanks at 5-500m elevation. S CA, San Clemente Island, central CA, AZ, TX, Baja, Sonora.	Mar-Oct	Fed: None Calif: S1S2 CRPR: 2B.2 MSHCP: AC d	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Navarretia fossalis Spreading navarretia	Annual herb. Chenopod scrub, shallow freshwater marshes and swamps, playas, vernal pools at 30-655m elevation. LA, Riverside, San Diego, San Luis Obispo Cos., Baja.	Apr-Jun	Fed: THR Calif: S2 CRPR: 1B.1 MSHCP: AC b	Absent; no suitable habitat six documented occurrences within 5 mi. (1922, exact location unknown, mapped 1.0 mi. SE; 2001-2017, closest is 1.6 mi. N, appears to have been developed), not observed during surveys.
Navarretia prostrata Prostrate vernal pool navarretia	Annual herb. Mesic areas in coastal scrub, valley and foothill grassland (alkaline), meadows and seeps, vernal pools at 3-1210m elevation. Locations in northern, central, and southern CA.	Apr-Jun	Fed: None Calif: S2 CRPR: 1B.2 MSHCP: AC d	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Orcuttia californica California Orcutt grass	Annual grass. Vernal pools at 15-660m elevation. LA, Orange, Riverside, San Diego, Ventura Co., Baja.	Apr-Aug	Fed: END Calif: END, S1 CRPR: 1B.1 MSHCP: AC b	Absent; no suitable habitat, three documented occurrences within 5 mi. (1941, exact location unknown, mapped 1.2 mi. NNE, possibly extirpated; 2001, 1.8 mi. ESE; 2015, 1.8 mi. E), not observed during surveys.
Polygala cornuta var. fishiae Fish's milkwort	Perennial deciduous shrub. Chaparral, cismontane woodland, riparian woodlands at 100-1000m elevation. LA, Orange, Riverside, Santa Barbara, San Diego, and Ventura Co., Baja. Not tracked in CNDDB.	May-Aug	Fed: None Calif: S4 CRPR: 4.3 MSHCP: AC	Absent; potentially marginal habitat, no mapped CCH records within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Pseudognaphalium leucocephalum White rabbit-tobacco	Perennial herb. Sandy or gravelly soils in chaparral, cismontane woodland, coastal scrub, riparian woodland at 0-2100m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Ventura Cos., AZ, NM, TX, Baja and Sonora Mex.	(Jul)Aug-Nov(Dec)	Fed: None Calif: S2 CRPR: 2B.2	Low; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Quercus engelmannii Engelmann oak	Perennial deciduous tree. Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland at 50-1300m elevation. Mostly in foothills of Orange, west Riverside, San Bernardino, and San Diego Counties, also southeast San Gabriel Mountain foothills (LA County). Not tracked in the CNDDB.	Mar-Jun	Fed: None Calif: S3 CRPR: 4.2	Absent; potentially suitable habitat, conspicuous plant not observed during surveys.
Romneya coulteri Coulter's matilija poppy	Large perennial rhizomatous herb. Often in burn areas in chaparral, coastal scrub at 20-1200m elevation. LA, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo Cos. Not tracked in CNDDB.	Mar-Jul(Aug)	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Absent; no or marginal habitat, conspicuous plant not observed during surveys.
Scutellaria bolanderi ssp. austromontana Southern mountains skullcap	Perennial rhizomatous herb. Mesic areas in chaparral, cismontane woodland, lower montane coniferous forest at 425-2000m elevation. Often in meadows and along streams. LA, Riverside, San Bernardino, San Diego Cos. Presumed extirpated in LA and San Bernardino Cos.	Jun-Aug	Fed: None Calif: S3 CRPR: 1B.2 USFS: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Sibaropsis hammittii Hammitt's clay-cress	Annual herb. Clay soils in chaparral openings, valley and foothill grassland at 720-1065m elevation. Riverside and San Diego Co.	Mar-Apr	Fed: None Calif: S2 CRPR: 1B.2 USFS: S MSHCP: AC b	Absent; no or marginal habitat, no documented occurrences within 5 mi., below elevation range, not observed during surveys.
Sidalcea neomexicana Salt spring checkerbloom	Perennial herb. Alkaline, mesic soils in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, playas at 15-1530m elevation. Kern, LA, Orange, Riverside, San Bernardino, San Diego, Ventura Cos., western US, Sonora Mex. Presumed extirpated in LA Co.	Mar-Jun	Fed: None Calif: S2 CRPR: 2B.2 USFS: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Sphaerocarpos drewiae Bottle liverwort	Ephemeral liverwort. Grows on soil in openings in chaparral and coastal scrub at 90-600m elevation. Riverside and San Diego Cos.	Not applicable	Fed: None Calif: S1 CRPR: 1B.1	Not expected; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Symphyotrichum defoliatum San Bernardino aster	Perennial rhizomatous herb. Near ditches, streams, springs in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, valley and foothill grasslands (vernally mesic) at 2-2040m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Imperial, Kern, Santa Barbara, San Luis Obispo Cos.	Jul-Nov	Fed: None Calif: S2 CRPR: 1B.2 USFS: S BLM: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Texosporium sancti-jacobi Woven-spored lichen	Crustose lichen. Grows on soil, small mammal pellets, dead twigs, and *Selaginella* species, in chaparral openings at 60-660m elevation. LA, Riverside, San Diego, Ventura, Santa Barbara, San Benito Cos., San Clemente Island, ID, OR, WA.	Not applicable	Fed: None Calif: S2 CRPR: 3	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Tortula californica California screw-moss	Moss. Sandy soil in chenopod scrub, valley and foothill grassland at 10-1460m elevation. LA, Riverside, San Diego, Ventura Cos., Central and Northern CA, Channel Islands.	Not applicable	Fed: None Calif: S2? CRPR: 1B.2 BLM: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Trichocoronis wrightii var wrightii Wright's trichocoronis	Annual herb. Alkaline soils in meadows and seeps, marshes and swamps, riparian forest, vernal pools at 5-435m elevation. Riverside Co., Central Valley, TX, Baja.	May-Sep	Fed: None Calif: S1 CRPR: 2B.1 MSHCP: AC b	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Viguiera laciniata San Diego County viguiera	Perennial shrub. Chaparral, coastal scrub at 60-750m elevation. Riverside, Orange, San Diego Cos (occurrences outside of San Diego Co are introduced), Baja and Sonora, Mexico. Not tracked in CNDDB.	Feb-Jun(Aug)	Fed: None Calif: S4 CRPR: 4.3	Absent; potentially suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.
References: CDFW (2021a, 2021c), USFWS (2021), CNPS (2021), Dudek (2003), RCA (2020)				

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Invertebrates			
Bombus crotchii Crotch bumble bee	Coastal CA E to Sierra-Cascade crest & S into Mexico. Open grassland and scrub habitats. Food plant genera include *Antirrhinum, Asclepias, Chaenactis, Lupinus, Medicago, Salvia, Phacelia, Clarkia, Dendromecon, Eschscholzia,* and *Eriogonum*. Lives in colonies that may be underground in rodent holes or above ground in rock piles, tree cavities, etc.	Fed: None Calif: SA[3], S1S2	Low to moderate; potentially suitable habitat, food plants present, two documented occurrences within 5 mi. (2001, 1.5 mi. WNW; 1975, exact location unknown, mapped 3.5 mi. NW), no bee colonies incidentally observed during surveys.
Branchinecta lynchi Vernal pool fairy shrimp	Vernal pools or similar vernal habitats, requires cool water pools (≤50ºF to hatch, ≤75ºF to survive); disjunct locations in Riverside Co. and the Coast Ranges thru Central Valley to Tehama Co., southern Oregon, up to elevation of 1159m.	Fed: THR Calif: SA, S3 MSHCP: AC a	Absent; no suitable habitat, no documented occurrences within 5 mi.
Branchinecta sandiegonensis San Diego fairy shrimp	Vernal pool complexes; endemic to San Diego and Orange County mesas. One occurrence in Murrieta is a transplant to a mitigation pool outside of native range.	Fed: END Calif: SA, S2	Absent; no suitable habitat, one documented occurrence within 5 mi. (2017, Clayton Ranch Mitigation Site; transplant outside of native range).
Cincindela senilis frosti Senile tiger beetle	Coastal salt marshes, tidal mud flats, interior alkali mud flats. CA and northern Mexico, San Diego Co. to Sonoma and Lake Co.	Fed: None Calif: SA, S1	Absent; no suitable habitat, no documented occurrences within 5 mi.
Danaus plexippus pop. 1 Monarch butterfly	California overwintering population.	Fed: CAN State: SA, S2S3 USFS: S (Los Padres NF)	Absent; individual butterflies may be present, but too far inland for overwintering.

[3] Crotch bumble bee was previously a candidate for state listing, but the Sacramento Superior Court ruled that insects are not eligible for listing under the California Endangered Species Act: *Almond Alliance of California v. California Department of Fish and Wildlife*, Sacramento Superior Court No. 34-2019-80003216 (Nov. 13, 2020). The California Fish and Game Commission filed an intent to appeal this decision in February 2021. The status of this species may be affected by subsequent litigation or changes to regulations.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Euphydryas editha quino Quino checkerspot butterfly	Coastal scrub, open chaparral, juniper woodland, native grassland. Western Riverside Co., southern San Diego Co., Baja. Flight season from mid-Jan to late May. Host plants are dwarf plantain (*Plantago erecta*), purple owl's clover (*Castilleja exserta*), white snapdragon (*Antirrhinum coulterianum*), wooly plantain (*Plantago patagonica*), thread-leaved bird's beak (*Cordylanthus rigidus*). USFWS considers species extirpated in San Bernardino Co.	Fed: END Calif: SA, S1S2 MSHCP: AC	Low; potentially marginal habitat, one host plant species present (*Plantago erecta*), 11 documented occurrences within 5 mi. (1997-2003, closest is 2.6 mi. SE), not observed during focused surveys in 2004 and not incidentally observed during later surveys.
Linderiella occidentalis California linderiella	Vernal pools, seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and total dissolved solids. N and Central CA, Riverside (Santa Rosa Plateau) and Ventura Cos.	Fed: None Calif: SA, S2S3	Absent; no suitable habitat, outside known geographic range.
Linderiella santarosae Santa Rosa Plateau fairy shrimp	Found only in the basalt vernal pools on Santa Rosa Plateau in Riverside County.	Fed: None Calif: SA, S1 MSHCP: AC a	Absent; no suitable habitat, outside known geographic range.
Neolarra alba White cuckoo bee	Cleptoparasitic in the nests of perdita bees. Known only from localities in Southern California. All occurrences are historical.	Fed: None Calif: SA, SH	Not expected; no documented occurrences within 5 mi., all occurrences are historical.
Socalchemmis icenoglei Icenogle's socalchemmis spider	Coastal scrub; known only from the type locality in the vicinity of Winchester, Riverside Co.	Fed: None Calif: SA, S1	Not expected; no documented occurrences within 5 mi.
Streptocephalus woottoni Riverside fairy shrimp	Endemic to Western Riverside, Orange, and San Diego counties in areas of tectonic swales/earth slump basins in grassland and coastal sage scrub. Coastal scrub, valley & foothill grassland, vernal pool, wetland. Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season. Generally restricted to pools greater than 12 inches deep. All known populations lie between 30 and 415 meters elevation.	Fed: END Calif: SA, S1S2 MSHCP: AC a	Absent; no suitable habitat, 8 documented occurrences within 5 mi. (2002-2017, closest extant is 1.8 mi. ESE).
Fish			
Gila orcuttii Arroyo chub	Slow-moving or backwater sections of warm/ cool streams with mud or sand substrates. LA, San Gabriel, San Luis Rey, Santa Ana & Santa Margarita Riv & Malibu & San Juan creeks.	Fed: None Calif: SSC, S2 MSHCP: AC USFS: S	Absent; no perennial aquatic habitat.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Amphibians			
Anaxyrus californicus Arroyo toad	Washes & intermittent streams of semi-arid regions, sandy-banked rivers, riparian woodlands, & loose gravel. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range, below 4600 ft. Southern California to tip of Baja California. Desert pop. along Mojave River.	Fed: END Calif: SSC, S2S3 MSHCP: AC c	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Rana draytonii California red-legged frog	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	Fed: THR Calif: SSC, S2S3 MSHCP: AC c	Absent; no perennial aquatic habitat.
Spea hammondii Western spadefoot toad	Cismontane woodland, coastal scrub, valley & foothill grassland, vernal pool. Breeds in quiet streams & vernal pools, burrows beneath sand during dry season. W CA, Central Valley to Baja California. From near sea level up to 4,500 ft elev.	Fed: None Calif: SSC, S3 BLM: S MSHCP: AC	Absent; no suitable habitat, 17 documented occurrences within 5 mi. (1998-2019, closest is 1.1 mi. NE), not observed during surveys.
Taricha torosa Coast Range newt	Valley-foothill hardwood and hardwood-conifer, coastal scrub, chaparral, grassland, mixed conifer. Coast Ranges from N San Diego Co. to central Mendocino Co., southern Sierra Nevada foothills S of Kaweah River. Spends most of the year in subterranean refuges, migrates to aquatic breeding areas in the fall and returns in the spring.	Fed: None Calif: SSC, S4 MSHCP: AC	Absent; no suitable aquatic breeding habitat on or adjacent to the site, no documented occurrences within 5 mi., not observed during surveys but is secretive.
Reptiles			
Anniella stebbinsi (Anniella pulchra pulchra) Southern California legless lizard	Various habitats, mainly shrublands, <6500 ft. elev. Coast Ranges from Bay area to N Baja CA, SW Sierra Nevada, parts of the Central Valley, Transverse & Peninsular Ranges.	Fed: None Calif: SSC, S3 USFS: S	Low to moderate; potentially suitable habitat, one documented occurrence within 5 mi. (2011, 3.9 mi. SW), not observed during surveys but is secretive.
Arizona elegans occidentalis California glossy snake	Arid scrub, rocky washes, grasslands, chaparral, often with loose or sandy soils. Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular Ranges, south to Baja California. Sea level to 7200' elev. Nocturnal.	Fed: None Calif: SSC, S2	Low; potentially marginal habitat, three documented occurrences within 5 mi. (1977, exact location unknown, mapped 3.4 mi. NW; 1946, exact location unknown, mapped 4.7 mi. SW; 1946, exact location unknown, mapped 4.2 mi. W), not observed during surveys but is nocturnal.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Aspidoscelis hyperythra Orange-throated whiptail	Low-elevation coastal scrub, chaparral, valley-foothill hardwood, sea level to 1040m. Sandy areas, patches of rock. S CA, west of desert to tip of Baja CA.	Fed: None Calif: WL, S2S3 USFS: S MSHCP: AC	Occurs; observed on the site during surveys.
Aspidoscelis tigris stejnegeri Coastal whiptail	Primarily hot, dry open areas with sparse foliage, chaparral, woodland, riparian; coastal So CA, mostly west of Peninsular Ranges and south of Transverse Ranges, north into Ventura County, below ±7000' elev. and into Baja.	Fed: None Calif: SSC, S3 MSHCP: AC	Occurs; observed on the site during surveys.
Coleonyx variegatus abbotti San Diego banded gecko	Rock outcrops in shrublands, to 5000' elevation; southwest Calif. through much of n. Baja Calif.	Fed: None Calif: SSC, S1S2 MSHCP: AC	Low; potentially marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Crotalus ruber Red-diamond rattlesnake	Desert scrub, thorn scrub, chaparral below 4,000ft. San Bernardino County S through most of Baja California, Mexico.	Fed: None Calif: SSC, S3 USFS: S MSHCP: AC	Low; no or marginal habitat, two documented occurrences within 5 mi. (2001, 2.5 mi. WSW; 2001, 1.5 mi. NW), not observed during surveys.
Diadophis punctatus modestus San Bernardino ringneck snake	Open relatively rocky areas within valley-foothill locales, mixed chaparral/annual grasslands. Prefers moist habitats. W San Diego & Riv. Cos., SW San Bern., Vent. & LA Cos., NW Baja CA.	Fed: None Calif: SA, S2? USFS: S	Low; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Emys marmorata Western pond turtle	Perennial ponds, streams, marshes, irrigation ditches. Coastal S & cent. CA, NW Baja CA, below about 4800 ft. elev. (few higher elev. pops.)	Fed: None Calif: SSC, S3 BLM: S USFS: S MSHCP: AC	Absent; no perennial aquatic habitat.
Phrynosoma blainvillii Coast horned lizard	Coastal sage scrub, low elevation chaparral, annual grassland, riparian scrub and woodlands, desert wash, pinyon and juniper woodland, valley and foothill grassland, 0-2438m elevation. SW California to NW Baja California, Mexico.	Fed: None Calif: SSC, S3S4 BLM: S MSHCP: AC	Occurs; observed on the site during surveys.
Salvadora hexalepis virgultea Coast patch-nosed snake	Shrublands, washes, sandy flats, rocky areas; Santa Barbara County through southwest Calif., to northwest Baja Calif. Diurnal.	Fed: None Calif: SSC, S2S3	Low; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Thamnophis hammondii Two-striped gartersnake	Usually in or near perennial fresh water & adjacent riparian habitat, pools in streams. SW CA & NW Baja California. Usually in or near perennial fresh water & adjacent riparian habitat, pools in streams. SW CA & NW Baja California. Primarily aquatic. Diurnal. Also active at night and at dusk during hot weather in some areas. Can be active most of the year depending on weather conditions. Has been found from January to November.	Fed: None Calif: SSC, S3S4 BLM: S USFS: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Birds			
Accipiter cooperii Cooper's hawk	Cismontane woodland, riparian forest, riparian woodland, upper montane coniferous forest. Forages in open areas over scrublands; California, Mexico, Central America. Nests in trees, often in dense woods. Year-round resident in most of southern California range. CNDDB only tracks nesting.	Fed: None Calif: WL, S4 MSHCP: AC	Occurs (foraging), low (nesting); observed on the site during surveys, no or marginal nesting habitat, no documented occurrences (nesting) within 5 mi.
Aechmophorus clarkii Clark's grebe	Requires large, open waters for courtship, feeding, and flocking, and extensive beds of tall, emergent vegetation such as tules or cattails for nesting; generally nests in colonies. Not tracked in CNDDB.	Fed: BCC Calif: None	Absent (foraging and nesting); no suitable habitat, may be seen in migration or moving between large lakes in the region, not observed during surveys.
Agelaius tricolor Tricolored blackbird	Breeds colonially in freshwater marshes, nomadic among marshes and fields in winter; almost completely endemic to Calif. Year-round resident in southern California range. CNDDB only tracks nesting.	Fed: BCC Calif: THR, SSC, S1S2 BLM: S MSHCP: AC	Low to moderate (foraging), absent (nesting); potentially suitable wintering habitat, no suitable nesting habitat, one documented occurrence (nesting) within 5 mi. (2008, 4.9 mi. SE), several eBird records in vicinity, not observed during surveys.
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	Sparse, mixed chaparral, scrub, rocky, brushy slopes. Central California to Baja California. Year-round resident in southern California range.	Fed: None Calif: WL, S3 MSHCP: AC	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Aquila chrysaetos Golden eagle	Found in a variety of habitats from sea level to 11,500 feet, rugged open habitats preferred. Large platform nests constructed on secluded cliffs, large trees, and occasionally structures (i.e., electrical transmission towers). CNDDB tracks nesting and wintering.	Fed: BGEPA, BCC Calif: FP, WL, S3 BLM: S MSHCP: AC	Not expected (foraging), absent (nesting); potentially marginal foraging habitat, no suitable nesting habitat, one documented occurrence (nesting) within 5 mi. (1974, 2.5 mi. N), multiple eBird records in vicinity (may be seen soaring overhead), not observed during surveys.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Ardea alba Great egret	Brackish and freshwater marshes, estuary, riparian forest, wetland. Colonial nester in large trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes. CNDDB only tracks nesting colonies.	Fed: none Calif: SA, S4	Occurs (foraging or fly over), absent (nesting); observed onsite during surveys, no nesting habitat or nesting colonies present.
Ardea herodias Great blue heron	Brackish and freshwater marshes, estuary, riparian forest, wetland. Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows. CNDDB only tracks nesting colonies.	Fed: none Calif: SA, S4 MSHCP: AC	Occurs (fly over), not expected (foraging), absent (nesting); no or marginal foraging habitat, no suitable nesting habitat, no documented occurrences (nesting) within 5 mi., multiple eBird records in vicinity.
Artemisiospiza belli Bell's sage sparrow	Sage scrub and chaparral communities. Nests mainly in shrubs, also in grass, and occasionally on ground under shrub. Found in coastal sage scrub in south of range. Central Washington southward to Baja California, Mexico. Year-round resident in southern CA.	Fed: BCC Calif: WL, S3 MSHCP: AC	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Asio otus Long-eared owl	Conifer, oak, riparian, pinyon-juniper, and desert woodlands that are open or adjacent to grasslands, meadows, or shrublands. Most of CA *except* Central Valley, coastal LA and Orange Co., western Imperial Co., and central Riverside Co. Very limited breeding range in southern CA. CNDDB only tracks nesting.	Fed: None Calif: SSC, S3?	Not expected (foraging and nesting); no or marginal habitat, no documented occurrences (nesting) within 5 mi., no eBird records in vicinity, not observed during surveys.
Athene cunicularia Burrowing owl	Nests in rodent burrows, usually in grasslands. Forages in open habitat; increasingly uncomm. in S CA. Occurs through W US/Mex. Sparse in desert scrub but common around irrigated lands. CNDDB tracks burrow sites and some wintering sites.	Fed: BCC Calif: SSC, S3 BLM: S MSHCP: AC c	Occurs; observed on site during focused surveys in 2018. Not observed during focused surveys in 2019 and 2021.
Buteo regalis Ferruginous hawk	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Great Basin grassland and scrub, pinyon and juniper woodlands, valley and foothill grassland. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles. Does not breed in southern CA.	Fed: BCC Calif: WL, S3S4 MSHCP: AC	Low (foraging), absent (nesting); potentially suitable habitat foraging habitat (when fields are fallow), outside of breeding range, three documented occurrences within 5 mi. (2008, 4.1 mi. NE; 2007, 3.9 mi ENE; 2008, 2.4 mi. E), a few eBird records in vicinity, not observed during surveys.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Buteo swainsoni Swainson's hawk	Grassland/agricultural, large trees for nesting, desert scrub with Joshua tree & Fremont cottonwood overstory, near streams & open fields. Breeds overwhelmingly in Great Basin & Central Valley of California. Seen in migration in southern California. CNDDB only tracks nesting.	Fed: BCC Calif: THR, S3 BLM: S MSHCP: AC	Low (foraging), absent (nesting), may be seen in migration; potentially marginal foraging habitat, outside current breeding range, a few eBird records in vicinity, not observed during surveys.
Calypte costae Costa's hummingbird	Desert and coastal scrub and chaparral in desert, semi-desert and mountain foothills and seasonally in mountains, adjacent open meadows and gardens. Found in NV, UT, AZ, CA and Mexico. Year-round resident in southern CA. CNDDB only tracks nesting.	Fed: BCC Calif: SA, S4	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Campylorhynchus brunneicapillus sandiegensis Coastal cactus wren	Desert scrub and coastal sage scrub with cactus patches; Southern CA and northwestern Baja. Non-migratory. Pairs defend territories throughout the year. Limited to San Diego and Orange Cos.	Fed: BCC Calif: SSC, S3 USFS: S MSHCP: AC	Absent (foraging and nesting); no suitable habitat, outside current range, not observed during surveys.
Chamaea fasciata Wrentit	Chaparral, oak woodland, shrublands, western CA, northwestern Baja, western Oregon. Year-round resident in southern CA range. CNDDB does not track this species.	Fed: BCC Calif: None	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Charadrius nivosus Western snowy plover	Coastal beaches, sand spits, salt pans, river bars. Coastal areas from Washington State south to Baja. Federal listing applies only to the Pacific coastal population. CNDDB only tracks nesting. Year-round resident in southern CA range except for eastern deserts where it is seen in migration.	Fed: THR, BCC Calif: SSC, S2	Absent (foraging and nesting); no suitable habitat, no documented occurrences (nesting) within 5 mi., no eBird records in vicinity, not observed during surveys.
Circus hudsonius (C. cyaneus) Northern harrier	Open habitats with hunting perches, marshes, meadows, grasslands, pastures, croplands, lake and river edges. Nests on the ground. Breeds widely but locally in North America, various portions of CA including Central Valley, central and northern coast, northeastern CA, and southern coastal CA. Does not breed in most of southern CA range. CNDDB only tracks nesting.	Fed: None Calif: SSC, S3 MSHCP: AC	Occurs (foraging), low to moderate (nesting); observed on the site during surveys, potentially suitable nesting habitat, no documented occurrences (nesting) within 5 mi.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Dryobates (Picoides) nuttallii Nuttall's woodpecker	Found in low elevation riparian and oak woodlands, rarely in conifers. Central Valley, Transverse and Peninsular Ranges, Coast Ranges north to Sonoma Co., lower portions of the Cascade Range and Sierra Nevada. Year-round resident throughout coastal mountains of CA. Not tracked in CNDDB.	Fed: BCC Calif: None	Occurs (foraging), moderate (nesting); observed on the site during surveys, potentially marginal nesting habitat.
Elanus leucurus White-tailed kite	Breeds in woodlands and riparian forests, forages over open terrain; Pacific Coast (Calif, northern Baja, Oregon), other scattered localities. Year-round resident in southern CA range. CNDDB only tracks nesting.	Fed: None Calif: FP, S3S4 BLM: S MSHCP: AC	Occurs (foraging), low (nesting); observed on the site during surveys, no or marginal nesting habitat, no documented occurrences (nesting) within 5 mi., five nests within 10 mi. of the site (see Section 3.4.1).
Empidonax traillii extimus Southwestern willow flycatcher	Dense riparian forests, wet mountain meadow systems with standing water for at least part of the breeding season (May to July) & with ample numbers of willow & other associated trees & shrubs. Rare & local in S CA. SW US & N Baja California. CNDDB only tracks nesting.	Fed: END Calif: END, S1 MSHCP: AC a	Absent (foraging and nesting); no suitable habitat, no documented occurrences within 5 mi., not observed during surveys. Habitat assessment found no suitable habitat on the site.
Eremophila alpestris actia California horned lark	Variety of open habitats with low growing vegetation or bare ground, grasslands, rangelands, "bald" hills, mtn. meadows, open coastal plains, fallow fields, alkali flats. Within coastal Sonoma Co. to San Diego Co., San Joaquin Valley & E to foothills.	Fed: None Calif: WL, S4 MSHCP: AC	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Haliaeetus leucocephalus Bald eagle	Breed in large trees, usually near major rivers or lakes. Winters more widely. Wide but scattered distribution in N America, esp. coastal regions. CNDDB tracks nesting and wintering.	Fed: Delisted, BGEPA, BCC Calif: END, FP, S3 MSHCP: AC BLM: S USFS: S	Absent (foraging and nesting); no suitable habitat, not observed during surveys.
Icteria virens Yellow-breasted chat	Summer resident, inhabits riparian thickets of willow near watercourses, low dense riparian willow. Migrant and summer resident in CA, northern CA, central coast, eastern Central Valley, coastal southern CA, Colorado River, western US, Canada, Mexico, Central America. CNDDB only tracks nesting.	Fed: None Calif: SSC, S3 MSHCP: AC	Not expected (foraging and nesting); no or marginal habitat, no documented occurrences (nesting) within 5 mi., few eBird records in vicinity, not observed during surveys.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Lanius ludovicianus Loggerhead shrike	Open areas where small trees, shrubs, and fences can provide suitable perches. Nests in small trees and large shrubs. Throughout much of North America. CNDDB only tracks nesting.	Fed: BCC Calif: SSC, S4 MSHCP: AC	Occurs (foraging), moderate (nesting); observed on the site during surveys, potentially suitable nesting habitat, one documented occurrence (nesting) within 5 mi. (2007, 4.5 mi. NE).
Plegadis chihi White-faced ibis	Freshwater wetlands, shallow lakes, wet meadows, flooded pastures and croplands. Nests in dense, fresh emergent wetland. Salton Sea, local winter visitor along coast, uncommon elsewhere in southern CA and Central Valley. CNDDB only tracks nesting colonies.	Fed: None Calif: WL, S3S4 MSHCP: AC	Not expected (foraging), absent (nesting); no suitable habitat, no documented occurrences (nesting) within 5 mi., few eBird records in vicinity, not observed during surveys.
Polioptila californica Coastal California gnatcatcher	Sage scrub, also chaparral, grasslands, riparian adjacent to or mixed with sage scrub below 2,500 ft elevation. S Ventura Co. to LA, Orange, Riv., San Bern., San D. Cos into Baja CA, Mexico.	Fed: THR Calif: SSC, S2 MSHCP: AC	Occurs (foraging and nesting); observed on the site during surveys including nest sites and breeding pairs.
Selasphorus rufus Rufous hummingbird	Breeds in open or shrubby areas, forest openings, yards and parks. Sometimes forests, thickets, swamps, meadows. Elev. range 0-6000 ft. Migrating birds can be up to 12,600 ft. Wintering birds in oak, pine, and juniper woodlands. Found in Western US and Canada. Generally migrates through southern CA during pre-breeding migratory season (mid-Feb to mid-May). CNDDB only tracks nesting.	Fed: BCC Calif: SA, S1S2	Occurs (foraging), not expected (nesting); observed onsite during surveys, outside breeding range, no documented occurrences (nesting) within 5 mi.
Setophaga petechia Yellow warbler	Migrant and summer resident in southern CA. Riparian, including willow, cottonwood, sycamore, alder, aspen for nesting & foraging, also conifer forest. CNDDB only tracks nesting.	Fed: BCC Calif: SSC, S3S4	Low (foraging and nesting); potentially marginal habitat, no documented occurrences (nesting) within 5 mi., few eBird records in vicinity, not observed during surveys.
Spinus lawrencei Lawrence's goldfinch	Summer breeder, may overwinter. Coastal side of southern and central CA, western edge of southern deserts, east side of Central Valley into northern CA, Colorado River, SW US and northern Mex. Valley foothill hardwood and hardwood-conifer, desert riparian, pinyon juniper, palm oasis, lower montane. Nests in oaks, conifers. CNDDB only tracks nesting.	Fed: BCC Calif: SA, S4	Occurs (foraging), low (nesting); observed on the site during surveys, potentially suitable or marginal nesting habitat, no documented occurrences (nesting) within 5 mi.
Toxostoma redivivum California thrasher	Chaparral. Coastal and foothill areas of California and NW Baja California, Mexico. Resident throughout its range. Not tracked in CNDDB.	Fed: BCC Calif: none	Occurs (foraging), moderate (nesting); potentially suitable or marginal nesting habitat.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Vireo bellii pusillus Least Bell's vireo	Riparian woodlands, bottomlands. N Mex. & Baja CA into S CA & the S mid-western US. CNDDB only tracks nesting.	Fed: END Calif: END, S2 MSHCP: AC a	Absent (foraging and nesting); no suitable habitat, two documented occurrences within 5 mi. (both along San Jacinto River - 2010, 4.6 mi. ENE; 2002, 4.2 mi. ENE), not observed during surveys. Habitat assessment found no suitable habitat on the site.
Xanthocephalus xanthocephalus Yellow-headed blackbird	Marsh, swamp, wetland. Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds. Nests only where large insects are abundant. CNDDB only tracks nesting.	Fed: None Calif: SSC, S3	Absent (foraging and nesting); no suitable habitat, few eBird records in vicinity, not observed during surveys.
Mammals			
Chaetodipus californicus femoralis Dulzura pocket mouse	Variety of habitats including coastal scrub, chaparral & grassland. Attracted to grass-chaparral edges. Chaparral, coastal scrub, valley and foothill grassland.	Fed: None Calif: SSC, S3	Low to moderate; potentially suitable or marginal habitat, no documented occurrences within 5 mi.
Chaetodipus (Perognathus) fallax Northwestern San Diego pocket mouse	Sandy herbaceous areas, usually in association with rocks or coarse gravel, chaparral, coastal scrub, grasslands. SW CA & NW Baja California (inland to San Bernardino Valley).	Fed: None Calif: SSC, S3S4 MSHCP: AC	Low to moderate; potentially marginal habitat, two documented occurrences within 5 mi. (1992, 3.4 mi. NE; 2009, 3.8 mi. S).
Dipodomys merriami parvus San Bernardino kangaroo rat	Alluvial floodplains and adjacent upland habitats within the San Bernardino, Menifee, and San Jacinto valleys, Riversidean alluvial fan sage scrub.	Fed: END Calif: CanE, SSC, S1 MSHCP: AC c	Absent; no suitable habitat, one documented occurrence within 5 mi. (1938, exact location unknown, mapped 4.4 mi. NNE).
Dipodomys stephensi Stephens' kangaroo rat	Sparse, gently sloping grassland, sometimes at margins of cultivated or disturbed lands; prefers grassland dominated by forbs rather than annual grasses, prefers sparse perennial vegetation; firm soil for burrowing (not too hard or too sandy); may use abandoned gopher burrows; W Riverside Co. and adjacent San Diego Co. San Bernardino County occurrences extirpated. No critical habitat has been designated.	Fed: END Calif: THR, S2 MSHCP: AC	High; potentially suitable habitat, 22 documented occurrences within 5 mi. (1938-2005, closest is 1.2 mi. N).

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Eumops perotis californicus Western mastiff bat	Lowlands (with rare exceptions), many open, semi-arid to arid habitats, conifer and deciduous woodlands, coastal scrub, grasslands, chaparral. Central & S CA, S AZ, NM, SW TX. Roosts in deep rock crevices, high buildings, trees, and tunnels; forages over wide area.	Fed: None Calif: SSC, S3S4 BLM: S	Low to moderate (foraging), low (roosting); potentially suitable foraging habitat, no or marginal roosting habitat, two documented occurrences within 5 mi. (1990, exact location unknown, mapped 2.6 mi. N; 2001, 1.5 mi. NW).
Lasiurus xanthinus Western yellow bat	Valley foothill riparian, desert riparian, desert wash, palm oasis. Roosts in trees, particularly palms. Forages over water and among trees. Desert regions of the SW US. Distributed in S CA, AZ, NM, & TX, into Mexico.	Fed: None Calif: SSC, S3	Not expected (foraging and roosting); no or marginal habitat, one documented occurrence within 5 mi. (1982, exact location unknown, mapped 2.7 mi. N).
Lepus californicus bennettii San Diego black-tailed jackrabbit	Chaparral, coastal, or Riversidean sage scrub with adjacent open grassland. Los Angeles Co. S to San Quintin, Baja California, Mexico.	Fed: None Calif: SSC, S3S4 MSHCP: AC	Occurs; observed on the site during surveys.
Neotoma lepida intermedia San Diego desert woodrat	Arid shrublands, rocky outcrops, & crevices. Cismontane CA., San Luis Obispo to San Diego Co. & NW Baja California. 0-7000 ft. elev. Variety of shrub and desert habitats, primarily associated with rock outcroppings, boulders, cacti, or areas of dense undergrowth. Constructs elaborate middens of sticks and other materials.	Fed: None Calif: SSC, S3S4 MSHCP: AC	Not expected; potentially marginal habitat, no documented occurrences within 5 mi., no middens observed during surveys.
Nyctinomops femorosaccus Pocketed free-tailed bat	Deserts & arid lowlands, pinyon juniper woodlands, desert scrub, riparian scrub, Joshua tree woodland, rocky areas with high cliffs. E Riverside & San Diego Cos. and Imperial Co., through SW US, Baja California, mainland Mexico. Roost mainly in crevices of high cliffs. Few records in So CA. Prefers rocky desert areas with high cliffs or rock outcrops. Feeds over ponds, streams, and arid desert.	Fed: None Calif: SSC, S3	Not expected (foraging and roosting); no suitable habitat, no documented occurrences within 5 mi.
Onychomys torridus ramona Southern grasshopper mouse	Nocturnal, active year-round. Desert scrub, coastal scrub, mixed chaparral, sagebrush, especially scrub habitats with friable soil, prefers low to moderate shrub cover. LA through San Diego counties and northwest Baja.	Fed: None Calif: SSC, S3	Low; potentially marginal habitat, one documented occurrence within 5 mi. (1932, exact location unknown, mapped 4.4 mi. NE).

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Perognathus longimembris brevinasus Los Angeles pocket mouse	Nocturnal, active Apr-Aug. Annual grassland, sage scrub, alluvial sage scrub. S California from Rancho Cucamonga (W boundary), San Gorgonio (E), Aguanga & Oak Grove, San Diego (S). Open ground with fine, sandy soils.	Fed: None Calif: SSC, S1S2 MSHCP: AC c	Low; potentially marginal habitat, no documented occurrences within 5 mi.
Perognathus longimembris internationalis Jacumba pocket mouse	Desert riparian, desert scrub, desert wash, coastal scrub and sagebrush. Rarely found on rocky sites.	Fed: None Calif: SSC, S2	Low; potentially marginal habitat, no documented occurrences within 5 mi.
Taxidea taxus American badger	Mountains, deserts, interior valleys where burrowing animals are available as prey & soil permits digging. Throughout Central & W North America.	Fed: None Calif: SSC, S3	Low; potentially suitable habitat, no badger burrows or diggings observed during surveys.

References: CDFW (2021b, 2021c), USFWS (2021), Dudek (2003), RCA (2020); Cornell (2021); eBird (2021); USFS (2013).

"Documented occurrences" refers to species occurrences in the California Natural Diversity Database (CNDDB) unless otherwise noted. For plant species that are not tracked in the CNDDB, records from the Consortium of California Herbaria (CCH) may be used (only CCH records that include map coordinates are utilized). EBird (eBird.org) is an online database of bird distribution and abundance sponsored by the Cornell Laboratory of Ornithology and compiled from observations submitted by citizen scientists. eBird records of bird observations are noted but should be interpreted with caution. eBird records "in vicinity" means records within about a 5-mile radius of the site.

Federal designations: (Federal Endangered Species Act, U.S. Fish and Wildlife Service):

- END: Federally listed, endangered; an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.
- THR: Federally listed, threatened; an animal or plant which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range.
- Cand Candidate for federal listing as threatened or endangered; species that has been studied by the U.S. Fish and Wildlife Service, and the Service has concluded that it should be proposed for addition to the Federal Endangered and Threatened species list.
- Prop Proposed for federal listing as Endangered or Threatened under Section 4 of the Endangered Species Act.
- Delisted: Previously federally listed as endangered or threatened, but is no longer listed (e.g., due to recovery).
- None: The species has no federal conservation status.
- BGEPA: Federal Bald and Golden Eagle Protection Act; protects bald and golden eagles.
- BCC: USFWS Bird of Conservation Concern; migratory and non-migratory bird species (beyond those already designated as Federally threatened or endangered) that represent USFWS highest conservation priorities.

State designations: (California Endangered Species Act, California Dept. of Fish and Wildlife)

- END: State listed, endangered; a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

CanE: Candidate Endangered; a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the Fish and Game Commission has formally noticed as being under review by the Department of Fish and Wildlife for addition to the list of endangered species, or a species for which the commission has published a notice of proposed regulation to add the species to the list of endangered species.

CanT: Candidate Threatened; a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the Fish and Game Commission has formally noticed as being under review by the Department of Fish and Wildlife for addition to the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to the list of threatened species.

THR: State listed, threatened; a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.

RARE: State listed as rare: a native plant species, subspecies, or variety when, although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens (Native Plant Protection Act of 1977).

SSC: CDFW Species of Special Concern; vertebrate species of concern due to declining population levels, limited ranges, and/or continuing threats that have made them vulnerable to extinction.

FP: Fully Protected; California Fish and Game Code states that Fully Protected species "...may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected" species, although take may be authorized for necessary scientific research.

Delisted: Previously state listed as threatened or endangered, but no longer listed (e.g., due to recovery).

SA: CDFW Special Animal; wildlife of state conservation concern.

SH: All California sites are historical, still some hope of rediscovery.

SX: All California sites are historical, presumed extirpated.

PFB: Protected Fur-bearing Mammal under Title 14 of the California Code of Regulations.

None: The species has no state conservation status.

State Rank (S Rank): A reflection of the condition and imperilment of an element (plant, animal, vegetation community) throughout its range within the state. The S ranks are determined through a combination of rarity, threat, and trend factors, weighted more heavily on the rarity factors. Where correct category is uncertain, the S rank includes two categories or a question mark. Older ranks, which need to be updated, may still contain a decimal "threat" rank of .1, .2, or .3, where .1 indicates very threatened status, .2 indicates moderate threat, and .3 indicates few or no current known threats.

S1: Critically imperiled; imperiled in the state because of extreme rarity or some factor(s) making it especially vulnerable to extirpation from the state.

S2: Imperiled; imperiled in the state because of rarity due to very restricted range, very few populations, steep declines, or other factors making it very vulnerable to extirpation from the state or nation.

S3: Vulnerable; vulnerable in the state due to a restricted range, relatively few populations, recent and widespread declines, or other factors making it vulnerable to extirpation. S4: Apparently secure; uncommon but not rare, some cause for long-term concern due to declines or other factors.

S5: Secure; common, widespread, and abundant in the state.

SH: Possibly extirpated; species or community occurred historically in the state, and there is some possibility that it may be rediscovered. The element has not been seen for at least 20 years, but suitable habitat still exists.

SX: Presumed extirpated; species or community is believed to be extirpated from the state.

California Rare Plant Rank (CRPR): The *California Rare Plant Ranks* are a ranking system originally developed by the California Native Plant Society (CNPS) to better define and categorize rarity in California's plants. These ranks were previously known as the CNPS lists but were renamed to the *California Rare Plant Ranks* to better reflect the joint effort among the CNPS, the CDFW, and a wide range of botanical experts, who work together to assign a rarity ranking.

1A: Plants presumed extinct in California and rare/extinct elsewhere.
1B: Plants rare, threatened, or endangered in California and elsewhere.
2A: Plants presumed extirpated in California, but more common elsewhere.
2B: Plants rare, threatened, or endangered in California but more common elsewhere.
3: Plants about which we need more information.
4: Plants of limited distribution.
X.1: Extension to CRPR (e.g., 1B.1); seriously threatened in California.
X.2: Extension to CRPR (e.g., 1B.2); fairly threatened in California.
X.3: Extension to CRPR (e.g., 1B.3); not very threatened in California.
CBR: Considered but rejected.

U.S. Forest Service (USFS) designation:

S: Sensitive; plant and animal species identified by a regional forester that are not listed or proposed for listing under the Federal Endangered Species Act for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Bureau of Land Management (BLM designation:

S: Sensitive; plant and animal species requiring special management consideration to promote their conservation and reduce the likelihood for future listing under the Federal Endangered Species Act. Includes species designated as sensitive by the BLM State Director and all Federal Candidate species and Federal delisted species in the 5 years following delisting. Sensitive species are managed as special status species.

Western Riverside County Multiple Species Habitat Conservation Plan: Applied to species that are covered under state and federal permits for the MSHCP.

NAC: Species Not Adequately Conserved
AC: Species Adequately Conserved
(a): Surveys may be required for these species as part of wetlands mapping as described in Section 6.1.2 of the MSHCP.
(b): Surveys may be required for these species within Narrow Endemic Plant Species survey area as described in Section 6.1.3 of the MSHCP.
(c): Surveys may be required for these species within locations shown on survey maps as described in Section 6.3.2 of the MSHCP.
(d): Surveys may be required for these species within Criteria Area as described in Section 6.3.2 of the MSHCP.
(e): These Covered Species will be considered Adequately Conserved when conservation requirements identified in species-specific conservation objectives have been met. Species-specific conservation objectives for these species are presented in Section 9.0 of the MSHCP. Please refer to Table 9-3 of the MSHCP for specific conservation objectives that must be met for these species prior to including them on the list of Covered Species Adequately Conserved.
(f): These Covered Species will be considered Adequately Conserved when a Memorandum of Understanding is executed with the U.S. Forest Service that addresses management for these species on Forest Service Land. Refer to Table 9-3 of the MSHCP.
No entry: Not a Covered Species

Definitions of occurrence probability:

These definitions provide general guidance. Classifications for individual species may be modified based on biologists' experience and expert opinion.

Occurs: Species was detected during surveys or previously documented on the Project site or adjacent areas.
High: Species documented in the vicinity (i.e., within 5 miles) of the Project site and suitable habitat is present, but species not detected during surveys.
Moderate: Species documented in the vicinity of the Project site or suitable habitat present and site is within geographic and elevational range of the species.

Low:	Species not documented in the vicinity of the Project site or suitable habitat is marginal.
Not Expected:	Species not documented in the vicinity of the Project site and suitable habitat marginal or absent, or site is not within geographic and elevational range of the species.
Absent:	No potential for the species to occur due to lack of habitat, geographic or elevation range, species life history, survey results, etc.
Unknown:	No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

APPENDIX C: PRECIPITATION DATA

Precipitation data from the Clark Remote Automatic Weather Station for October 2002 through September 2021, by water year (October 1 through September 30) (WRCC 2021).

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2003	0.07	0.79	1.83	0.02	5.08	2.99	1.70	0.33	0.06	0.06	0.04	0	12.97
2004	0	0.92	0.62	0.29	3.22	0.92	0.39*	*	*	*	0.60*	0*	6.96*
2005	4.96	0.64	2.41	5.39	6.45	1.10	0.57	0.29	0.04	*	0.01*	0.37*	22.23*
2006	1.12	1.12*	0.35	0.62	1.59	1.55	1.32	0.28	0	0.25	0	0	8.20*
2007	0.03	0.05	0.70	0.16	0.42	0.38	0.49	0.03	0	0	0	0.03	2.29
2008	0.20	1.82	0.70	2.61	0.79	0.59	0.03	0.49	0.01	0	0	0	7.24
2009	0	1.18	2.83	0.05	0.95	0.03	0	0	0	0	0	0.01	5.05
2010	0	0.10	1.68	6.01	1.83	0.21	0.87	0.01	0	0	0	0.11	10.82
2011	0.48	0.55	8.23	0.38	2.37	1.44	0.19	0.22	0	0.29	0	0	14.15
2012	0.22	1.34	0.33	0.45	0.56	1.09*	1.17	0.02	0	0.15	0.46	0.04	5.83*
2013	0.16	0.40	2.02	0.58	0.93	0.59	0	0.29	0	0.04	0.12	0	5.13
2014	0.66	0.94	0.34	0	1.25	0.59	0.58	0	0	0	0.20	0	4.56
2015	0.20	0.23	3.18	0.68	0.47	0.73	0.17	0.97	0	0.99	0	0.75	8.37
2016	0.42	0.29	0.35	2.35	0.14	0.72	1.20	0.27	0	0	0	0.03	5.77
2017	0.64	1.10*	3.44	4.44	2.36	0.07	0	0.07	0	0.03	0.24	0	12.39*
2018	0	0.09	0	1.85	0.27	1.13	0.01	0.20	0	0	0	0	3.55
2019	1.02	1.08	1.33	2.27	4.37	1.96	0.02	0.87	0	0	0	0	12.92
2020	0	2.19	2.69	0.04	0.32	3.65	3.73	0	0.04	0	0	0	12.66
2021	0	0.14	1.18	2.00	0.01	1.30	0	0*	0.07*	0.10	0	0.16	4.96*

*missing or suspect data.

Precipitation data from the Sage Remote Automatic Weather Station for October 2010 through September 2021[4], by water year (October 1 through September 30) (WRCC 2021).

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2011	1.13	0.96	7.73	0.52	4.12	1.65	0.32	0.48	0.04	0.52	0	0.02	17.49
2012	0.89	2.02	0.95	0.55	1.88	1.65	1.68	0.04	0	0.22	2.06	0.15	12.09
2013	0.16	0.39	1.74	0.83	1.27	1.04	0.06	0.51	0	0.01	0.20	0.13	6.34
2014	0.90	0.62	0.45	0.04	1.69	0.69	0.32	0	0	0	1.22	0.56	6.49
2015	0.10	0.77	4.22	0.68	0.87	0.70	0.18	1.99	0	1.36	0	0.85	11.72
2016	0.57	0.59	1.23	3.10	0.11*	0.93	0.40	0.11	0	0	0	0.75	7.79*
2017	0.19	1.20	4.18	4.97	4.05	0.13	0	0.42	0	0.01	0.18	0.06	15.39
2018	0.02	0.09	0	2.63	0.46	2.35	0	0.12	0.01	0.04	0	0	5.72
2019	0.92	1.18	1.61	2.54	7.34	1.84	0.20	1.41	0.02	0	0	0.10	17.16
2020	0	3.01	2.39	0.53	0.40	4.78	4.44	*	0.04	0.01	0	0	15.60*
2021	0.09	0.62	1.43	1.62	0.20	1.54	0.31	0	0	0.31	0	0.07	6.19

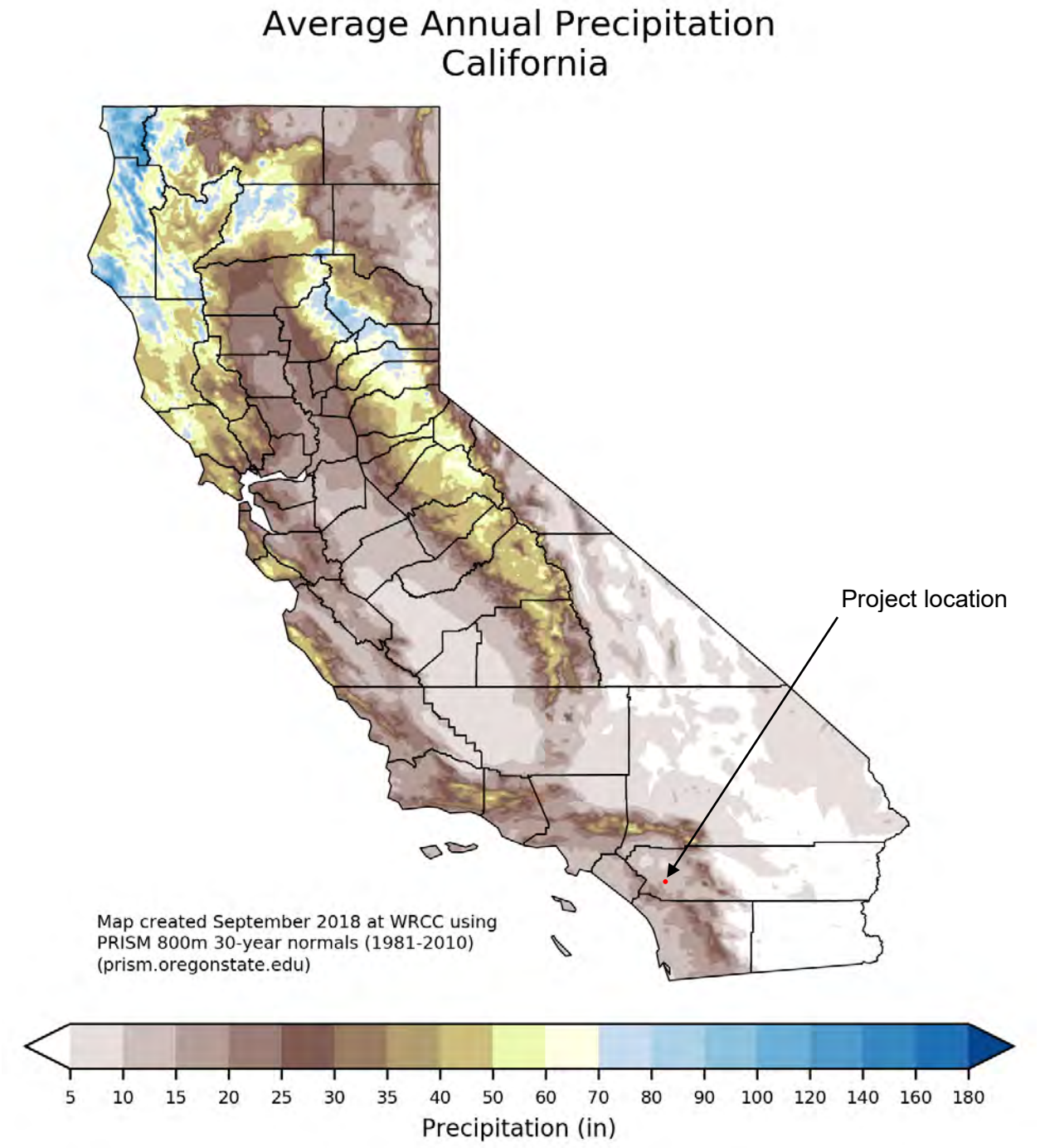
*missing or suspect data.

[4] The record for the Sage Weather Station begins in 2010.

Precipitation data from the Cranston Remote Automatic Weather Station for October 2002 through September 2021, by water year (October 1 through September 30) (WRCC 2021).

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2003	0.01	1.41	2.62	0.08	4.18	3.26*	1.71	0.12	0.08	0.37	0.10	0.08	14.02*
2004	0	2.18	0.83	0.33	3.72	2.86	0.97	0.02	0	0*	0.02	0	10.93*
2005	6.34	1.85	3.83	8.17	5.38	1.20	1.58	0.85	0	1.38	1.42	0.17	32.17
2006	1.46	0	0.22	0.92	2.06	3.15	2.29	0.32	0	0.33	0	1.02	11.77
2007	0.21	0.07	0.45	0.24	1.95	0.25	0.69	0.03	0	0.01	0.04	0.20	4.14
2008	0	2.31	1.36	4.77	1.92	0.47	0	1.21*	0*	0.15*	0*	0*	12.19*
2009	0*	0.39*	0.26*	0.34*	1.56*	0.03*	0.62*	0.08*	0.03*	0*	0*	0.02*	3.33*
2010	0.04*	0.26*	0.57*	2.80*	2.42*	0.80*	0.76*	0*	0*	0.10*	0.39	0.04	8.18*
2011	2.09	1.14	8.98	0.74	3.83	1.69	0.19	0.23	0.03	0.48	0	0.03	19.43
2012	0.33	2.33	0.53	0.38	1.77	1.71	1.45	0.03	0	0.03	2.30	0.89	11.75
2013	0.26	0.16	1.39	1.15	0.98	1.29	0.08	0.22	0	0	0.57	0.21	6.31
2014	0.74	0.58	0.31	0.01	2.23	1.35	0.60	0.01	0	0.32	1.35	2.09	9.59
2015	0.06	0.55	4.53	0.25	0.81	0.84	0.35	1.94	0.31	3.54	0	0.82	14.00
2016	0.85	0.47	1.66	3.41	0.12*	0.80	0.39	0.84	0	0	0.03	0.68	9.25*
2017	0.55*	1.26	4.21	5.56	3.93	0.21	0	0.41	0.01	0	0.21	0	16.35*
2018	0.01	0.06	0	2.15	0.62	2.79	0.01	0.28	0	0.28	0	0	6.2
2019	0.87	0.80	1.74	3.05	9.02	2.07	0.32*	1.87	0.01	0	0	0.08	19.83*
2020	0	3.38	2.44	0.34	0.54	5.04	3.85	0.06	0.03	0	0.21	0	15.89
2021	0	0.52	1.39	2.39	0.28	1.33	0.36	0.05	0.03	0.37	0	0.03	6.75

*missing or suspect data.



From WRCC (2018)

APPENDIX D: SITE PHOTOGRAPHS

Agricultural fields, south-central area of site facing northwest (05.25.2021).

Agricultural fields, central area of site facing north; slopes with coastal scrub visible in background (05.25.2021).

Agricultural fields after mowing, south-central area of site facing east (11.08.2021).

Overview of site after agricultural fields mowed, from slope at north-central edge of site facing south; coastal scrub in foreground (11.08.2021).

California buckwheat scrub, northeastern area of site facing south (05.21.2021).

California buckwheat scrub, northeastern corner of site facing southwest (05.21.2021).

California buckwheat scrub/ruderal, east-central area of site facing southeast (05.21.2021).

California buckwheat scrub/ruderal, northwest area of site facing south (05.25.2021).

Chamise chaparral, south-central edge of site facing northwest (05.25.2021).

Area of chamise chaparral after it was mowed, south-central edge of site facing west (11.08.2021).

Scattered riparian vegetation along blue-line stream, northwest area of site facing southeast (11.08.2021).

Scattered riparian vegetation along blue-line stream, northwest-central area of site facing north (11.08.2021).

Offsite area along Wickerd Road, facing west (05.21.2021).

Offsite area along Wickerd Road, facing west (05.21.2021).

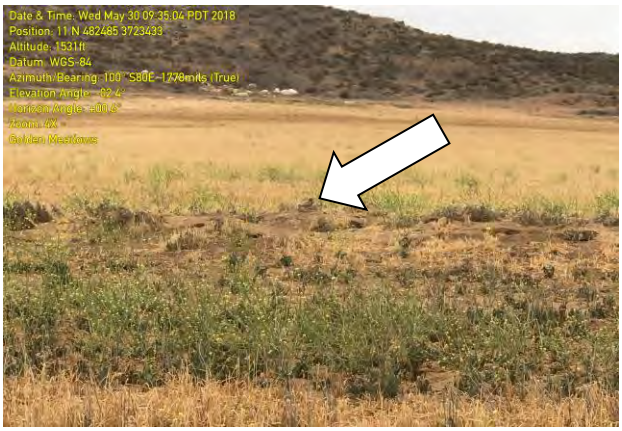
Areas of long-spined spineflower observation in 2017, facing east (11.08.2021). This area has been impacted by OHV use and the species was not observed during surveys in 2018, 2019, and 2021.

Southern California black walnut tree in riparian area, facing north (11.08.2021).

Southern California black walnut tree in riparian area, facing northwest, eucalyptus tree at right (11.08.2021).

Non-native pepper trees along western boundary of site, facing north (05.25.2021). Tree on left is offsite.

Scattered trees in the riparian area, facing south (05.25.2021).



Burrowing owl observed onsite on May 30, 2018. The owl was not observed during subsequent surveys in 2018. No owls or owl sign were observed during surveys in 2019 and 2021.

Burrowing owl burrow in 2018. This burrow was not occupied during surveys in 2019 and 2021.

Location of 2018 burrow in 2021 after agricultural fields were mowed, facing south (11.08.2021). There was no evidence of occupation before or after mowing.

Potentially suitable burrow with no signs of occupation, after agricultural fields mowed, southeast area of site facing east (11.08.2021).

Potentially suitable habitat for burrowing owl and potential burrow locations were thoroughly searched and no evidence of occupation was found in 2019 and 2021.

APPENDIX E: CNDDB FORMS

CNDDB forms for 2021 observations are provided below. The forms were submitted to CDFW online. The CNDDB only tracks nesting for Cooper's hawk and nesting was not observed, so a CNDDB form for this species is not required. The CNDDB does not track Nuttall's woodpecker or wrentit, so CNDDB forms for these species are not required.

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0015
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Lepus californicus bennettii*

Common name: San Diego black-tailed jackrabbit

Date of field work (mm-dd-yyyy): 05-25-2021

Comment about field work date(s):

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist

Identification explanation:

Identification confidence: Very confident

Species found: Yes **If not found, why not?**

Level of survey effort: General biological survey

Total number of individuals: 1

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
1				

Age class comment:

Site use description:

What was the observed behavior?

Describe any evidence of reproduction:

Submitted: 11/09/2021 BRU21F0015 Page 1 of 2

SITE INFORMATION

Habitat description: California buckwheat scrub adjacent to agricultural fields (dry farmed wheat)

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability: Fair

Immediate & surrounding land use: Agriculture

Visible disturbances:

Threats: Planned development

General comments:

MAP INFORMATION

ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Riverside	Romoland	1563	33.65359	-117.18804	482565	3723765	11
1	**Public Land Survey**	**Feature Comment**						
	S T06S R03W 15							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Mapping notes:

Location/directions comments:

Attachment(s):

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0019
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Polioptila californica californica*

Common name: coastal California gnatcatcher

Date of field work (mm-dd-yyyy): 06-07-2021

Comment about field work date(s): Species also observed at this location on 05.31.2021

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist holding a USFWS permit for this species.

Identification explanation:

Identification confidence: Very confident

Species found: Yes **If not found, why not?**

Level of survey effort: General biological survey

Total number of individuals: 3

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
3				

Age class comment: 2 adult males and 1 adult female observed

Submitted: 11/09/2021 BRU21F0019 Page 1 of 3

Bird site use:

☐ Nesting ☐ Rookery ☐ Nesting colony ☐ Burrow site ☐ Lek
☐ Non-breeding (over-wintering) ☐ Communal roost ☑ Other

Site use description: Foraging, nesting not observed

What was the observed behavior? Foraging

Describe any evidence of reproduction:

SITE INFORMATION

Habitat description: California buckwheat scrub

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability:

Immediate & surrounding land use: Agriculture

Visible disturbances: OHV trails

Threats: Planned development

General comments: CNDDB EO#736

MAP INFORMATION

ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Riverside	Romoland	1643	33.65496	-117.18490	482855	3723916	11
1	**Public Land Survey**	**Feature Comment**						
	S T06S R03W 15							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Submitted: 11/09/2021 BRU21F0019 Page 2 of 3

Mapping notes:

Location/directions comments:

Attachment(s):

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0018
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Eremophila alpestris actia*

Common name: California horned lark

Date of field work (mm-dd-yyyy): 05-25-2021

Comment about field work date(s):

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist

Identification explanation:

Identification confidence: Very confident

Species found: Yes **If not found, why not?**

Level of survey effort: General biological survey

Total number of individuals: Flock of several

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
Several				

Age class comment:

Submitted: 11/09/2021 BRU21F0018 Page 1 of 3

Bird site use:

☐ Nesting ☐ Rookery ☐ Nesting colony ☐ Burrow site ☐ Lek
☐ Non-breeding (over-wintering) ☐ Communal roost ☑ Other

Site use description: Foraging

What was the observed behavior? Foraging

Describe any evidence of reproduction:

SITE INFORMATION

Habitat description: Agricultural field (dry farmed wheat)

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability:

Immediate & surrounding land use: Agriculture

Visible disturbances:

Threats: Planned development

General comments:

MAP INFORMATION

ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Riverside	Romoland	1537	33.65118	-117.19723	481711	3723499	11
1	**Public Land Survey**	**Feature Comment**						
	S T06S R03W 16							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Submitted: 11/09/2021 BRU21F0018 Page 2 of 3

Mapping notes:

Location/directions comments:

Attachment(s):

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0017
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Eremophila alpestris actia*

Common name: California horned lark

Date of field work (mm-dd-yyyy): 06-05-2021

Comment about field work date(s): Also observed on 05.21.2021

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist

Identification explanation:

Identification confidence: Very confident

Species found: Yes If not found, why not?

Level of survey effort: General biological survey

Total number of individuals: Flock of several

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
Several				

Age class comment:

Submitted: 11/09/2021 BRU21F0017 Page 1 of 3

Bird site use:

☐ Nesting ☐ Rookery ☐ Nesting colony ☐ Burrow site ☐ Lek
☐ Non-breeding (over-wintering) ☐ Communal roost ☑ Other

Site use description: Foraging

What was the observed behavior? Foraging

Describe any evidence of reproduction:

SITE INFORMATION

Habitat description: Agricultural field (dry farmed wheat)

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability:

Immediate & surrounding land use: Agriculture

Visible disturbances:

Threats: Planned development

General comments:

MAP INFORMATION

ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
1	Riverside	Romoland	1558	33.65088	-117.18529	482819	3723463	11
	Public Land Survey	**Feature Comment**						
	S T06S R03W 15							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Mapping notes:

Location/directions comments:

Attachment(s):

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0016
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Eremophila alpestris actia*

Common name: California horned lark

Date of field work (mm-dd-yyyy): 07-06-2021

Comment about field work date(s):

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist

Identification explanation:

Identification confidence: Very confident

Species found: Yes **If not found, why not?**

Level of survey effort: General biological survey

Total number of individuals: Flock of several

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
Several				

Age class comment:

Submitted: 11/09/2021 BRU21F0016 Page 1 of 3

Bird site use:

☐ Nesting ☐ Rookery ☐ Nesting colony ☐ Burrow site ☐ Lek
☐ Non-breeding (over-wintering) ☐ Communal roost ☑ Other

Site use description: Foraging

What was the observed behavior? Foraging

Describe any evidence of reproduction:

SITE INFORMATION

Habitat description: Agricultural fields (dry farmed wheat)

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability:

Immediate & surrounding land use: Agriculture

Visible disturbances:

Threats: Planned development

General comments:

MAP INFORMATION

ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Riverside	Romoland	1542	33.64972	-117.18907	482468	3723335	11
1	**Public Land Survey**	**Feature Comment**						
	S T06S R03W 16							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Mapping notes:

Location/directions comments:

Attachment(s):

APPENDIX F: RIVERSIDE COUNTY DOCUMENTATION

Certification

Certification: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: December 17, 2021 SIGNED: _____

Leslie Irish, Principal, L&L Environmental, Inc.
909-335-9897

1) Fieldwork Performed By:

Guy Bruyea
Name

2) Fieldwork Performed By:

John Konecny
Name

3) Fieldwork Performed By:

_____
Name

4) Fieldwork Performed By:

_____
Name

5) Fieldwork Performed By:

_____
Name

6) Fieldwork Performed By:

_____
Name

Check here __ if adding any additional names / signatures below or on other side of page.

BIOLOGICAL REPORT SUMMARY SHEET

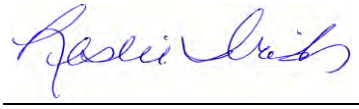
Applicant Name: Richland Communities
Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001
Section, Township and Range: Sections 15 and 16, Township 6 South, Range 3 West
Building and Safety Log Number: _____
Case Number: TR 31194 Lot/Parcel _____ EA Number _____

MARK ITEM(S) SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE of CONCERN	*(Mark Yes, No, or N/A regarding species findings on the referenced site)*		
		Yes	**No**	**n/a**
	Arroyo Southwestern Toad			X
X	Blue-line Stream(s)	X		
X	Burrowing Owl	X (2018)	X (2021)	
	Coachella Valley Fringed-toed Lizard			X
X	Coastal California Gnatcatcher	X		
X	Coastal Sage Scrub	X		
	Delhi Sands Flower-loving Fly			X
	Desert Pupfish			X
	Desert Slender Salamander			X
	Desert Tortoise			X
	Flat-tailed Horned Lizard			X
X	Least Bell's Vireo (habitat)		X	
X	Oak Woodlands		X	
X	Quino Checkerspot Butterfly (2004 survey)		X	
X	Riverside Fairy Shrimp (habitat)		X	
X	Santa Ana River Woolystar		X	
	San Bernardino Kangaroo Rat			X
X	Slender-horned Spineflower		X	
	Stephens' Kangaroo Rat			X
X	Vernal Pools		X	
X	Wetlands	X		
X	Long-spined spineflower	X (2017)	X (2021)	
X	Southern California black walnut	X		
X	Coast Horned Lizard (previous survey)	X		
X	Orange-throated Whiptail (previous survey)	X		
X	Coastal (Western) Whiptail (previous survey)	X		
X	Cooper's Hawk	X		
X	Northern Harrier (previous survey)	X		
X	White-tailed Kite (previous survey)	X		
X	California Horned Lark	X		
X	Great Egret (previous survey)	X		
X	Great Blue Heron (previous survey)	X		
X	Lawrence's Goldfinch (previous survey)	X		
X	Loggerhead Shrike (previous survey)	X		
X	California Thrasher (previous survey)	X		

MARK ITEM(S) SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE of CONCERN	*(Mark Yes, No, or N/A regarding species findings on the referenced site)*		
		Yes	No	n/a
X	Southern California Rufous-crowned Sparrow (previous survey)	X		
X	Bell's Sage Sparrow (previous survey)	X		
X	Nuttall's Woodpecker	X		
X	Wrentit	X		
X	Costa's Hummingbird (previous survey)	X		
X	Rufous Hummingbird (previous survey)	X		
X	San Diego Black-tailed Jackrabbit	X		

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened, or candidate species by either state, or federal regulations, or for Riverside County as listed by the California Department of Fish and Wildlife Natural Diversity Data Base (CNDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report or habitat assessment.



L & L Environmental, Inc. — Signature and Company Name

December 17, 2021 — Date

_____ — 10(a) Permit Number (if applicable)

_____ — Permit Expiration Date

County Use Only

Received By: _____ Date: _____

PD-B# _____

Attachment E-4

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources

Case Number: TR 31194 Lot/Parcel No. _____ EA Number _____

Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001

Date: December 17, 2021

Biological Resources: (Check the level of impact that applies to the following questions.)

Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?

☐ ■ ☐ ☐

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?

☐ ■ ☐ ☐

c) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, or U. S. Wildlife Service?

☐ ■ ☐ ☐

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

☐ ■ ☐ ☐

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources

e) Have a substantial adverse effect on any riparian habitat, or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife, or the U.S. Fish and Wildlife Service?

☐ ■ ☐ ☐

f) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption)?

☐ ■ ☐ ☐

g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

☐ ■ ☐ ☐

Findings of Fact:

The site is located within the area covered by the MSHCP but is not within the Criteria Area. There is one area of PQP Conserved Lands approximately 0.68 miles north-northeast of the site (Ringing Rock Archaeological Site). Other than the Ringing Rock Site, there are no other PQP or MSHCP Conserved Lands within a mile of the site. The site is not within or near any MSHCP Core Areas or Linkages.

There is one sensitive vegetation community present, arroyo willow thicket.

No state or federally listed plants were observed. Two special status plant species were observed, long-spined spineflower and southern California black walnut.

There is one immature coast live oak and other native and non-native trees present.

Coastal California gnatcatcher present and nesting on the site. White-tailed kite observed during previous surveys, but no nesting detected.

No vernal pools or ponding areas and no fairy shrimp habitat.

Riparian birds (least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo) considered absent.

Special status wildlife species detected: orange-throated whiptail, coastal (western) whiptail, coast horned lizard, Cooper's hawk, southern California rufous-crowned sparrow, great egret, great blue heron (fly over), Bell's sage sparrow, burrowing owl, Costa's hummingbird, wrentit, northern harrier, Nuttall's woodpecker, California horned lark, loggerhead shrike, rufous hummingbird, Lawrence's goldfinch, California thrasher, and San Diego black-tailed jackrabbit.

One (1) adult burrowing owl and an occupied burrow observed in 2018. No owls or owl sign observed in 2019 or 2021.
There is habitat suitable for nesting birds (including raptors) within and adjacent to the site.

The site is not within or adjacent to a wildlife corridor.

A mapped blue-line stream is present and includes MSHCP riparian/riverine habitat as well as state waters/wetlands and federal waters. Regulatory permitting and a DBESP will be required.

Proposed Mitigation:

Preconstruction surveys for burrowing owl.

Preconstruction surveys for nesting birds during nesting season.

Avoidance of riparian habitat and offsite compensation for impacts.

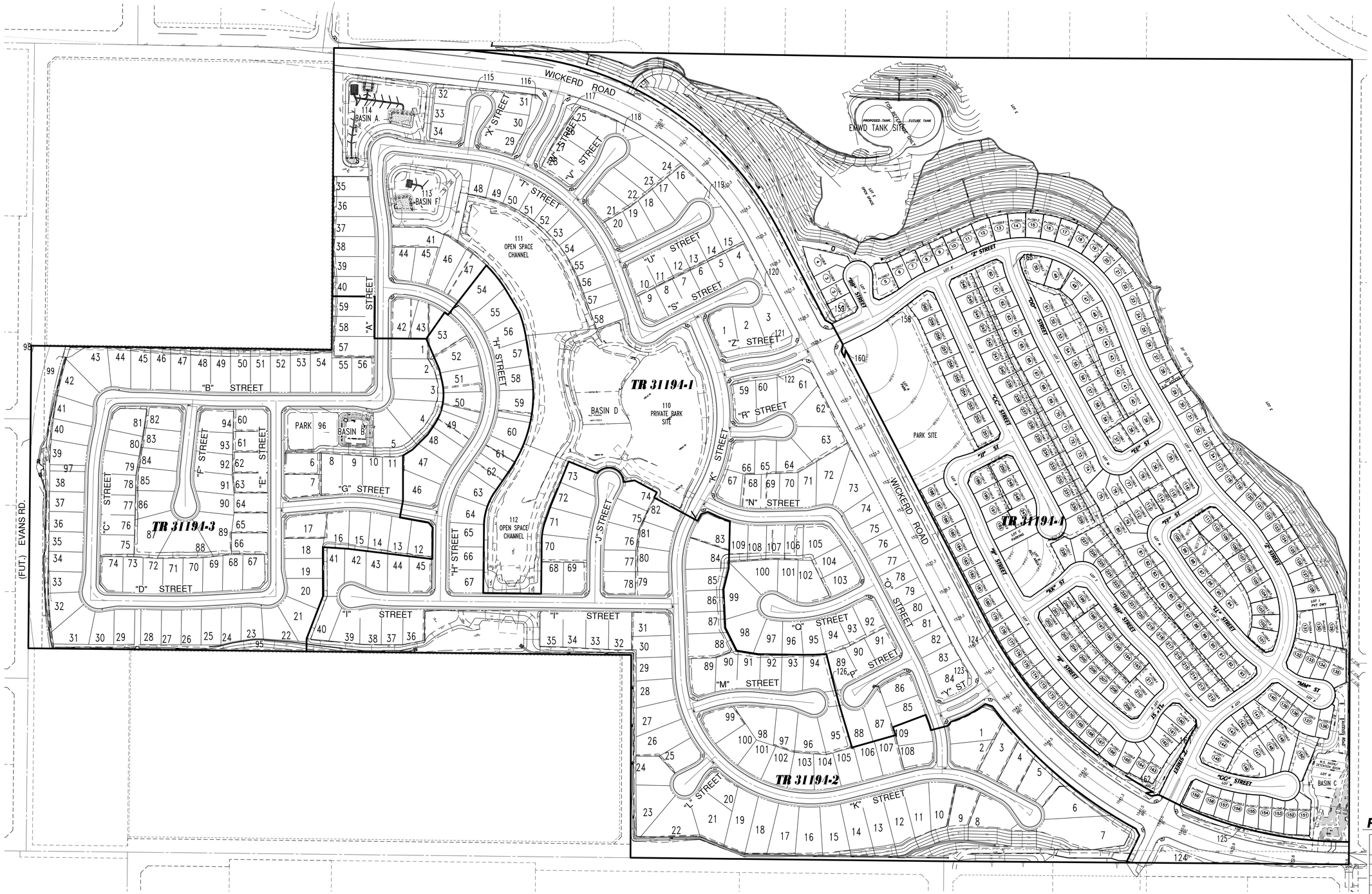
Monitoring Recommended:

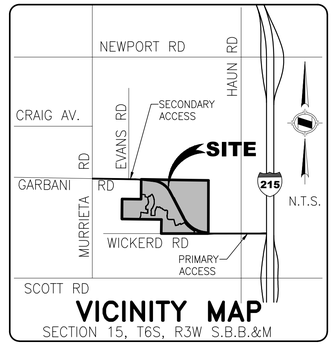
Monitoring of active coastal California gnatcatcher nest sites during Project activities recommended.

Monitoring of Project activities that disturb vegetation or soil in and adjacent to the Avoidance Area is recommended.

Source: CGP Fig. VI.36-VI.40
Revised October 1999

APPENDIX G: SITE PLAN





VICINITY MAP

SECTION 15, T6S, R3W S.B.B.&M

SCALE: 1" = 150'

RESIDENTIAL LOT COUNT

	EXIST.No. OF RES. LOTS	PROP. NO. OF RES. LOTS
PHASE 1 (MINOR MOD.)	105 LOTS	109 LOTS
PHASE 2 (MINOR MOD.)	111 LOTS	109 LOTS
PHASE 3	94 LOTS	94 LOTS
PHASE 4 (MAJOR MOD.)	156 LOTS	260 LOTS
TOTAL	466 LOTS	572 LOTS

GOLDEN MEADOWS
TENTATIVE TRACT MAP NO. 31194
PROPOSED LOT ADJUSTMENT
SITE PLAN EXHIBIT

SHEET 1 OF 1

DATE: Aug 12, 2021

H:\00546\Engineering\Project Exhibits\Lot Line Adjustments Exhibits\TR 31194_Proposed Adjustments Overall Exhibit.dwg 8/12/2021 10:57 AM

L&L ENVIRONMENTAL, INC.
REGULATORY SERVICES
BIOLOGICAL & CULTURAL INVESTIGATIONS & MONITORING

FOCUSED BURROWING OWL AND RAPTOR NEST SURVEYS FOR TRACT 31194, GOLDEN MEADOWS, CITY OF MENIFEE, CALIFORNIA

±207 Acre Property, ±207 Acres Surveyed

APNs 360-300-002, -003, -004, -005, -006, -009, 360-350-001, and portions of offsite 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -024, 360-360-009, -010, -011, and 360-380-004, Tract 31194, Menifee Area, Sections 15 and 16, Township 6 South, Range 3 West, USGS Romoland, 7.5' Topographic Quadrangle

Prepared For:

Mike Byer and Craig Cristina
Richland Communities
3161 Michelson Drive, Suite 425
Irvine, CA 92612
949-261-7010

Prepared By:

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Carla Wakeman, Senior Biologist — cwakeman@llenviroinc.com
Jeffrey Sonnentag, Technical Editor — jsonnentag@llenviroinc.com

Report Summary:

One (1) burrowing owl and one (1) occupied burrow were observed onsite in 2018. A winter burrowing owl survey, preparation of a Burrowing Owl Exclusion Plan, and preconstruction survey are recommended. One (1) inactive raptor nest is present, but no active nests were observed. Habitat suitable for nesting birds (including raptors) is present within and around the site and a preconstruction survey is recommended. Previous surveys identified one (1) listed species (coastal California gnatcatcher) and several special status species onsite, including white-tailed kite, northern harrier, coast horned lizard, coastal (western) whiptail, orange-throated whiptail, San Diego black-tailed jackrabbit, Cooper's hawk, California horned lark, great blue heron, Costa's hummingbird, and long-spined spineflower. There is no evidence of white-tailed kite nesting on the project site. Jurisdictional riparian/riverine areas were previously identified on the project site. Regulatory permits will be required for impacts to jurisdictional areas. No vernal pools or areas of potential habitat for fairy shrimp were observed or are present onsite.

Surveys Conducted By: Guy Bruyea
Surveys Conducted: May through July 2018
Report Date: October 2018

Celebrating 20+ Years of Service to Southern CA and the Great Basin, WBE Certified (Caltrans, CPUC, WBENC)
Mailing Address: 700 East Redlands Blvd, Suite U, PMB#351, Redlands CA 92373
Delivery Address: 721 Nevada Street, Suite 307, Redlands, CA 92373
Webpage: llenviroinc.com | Phone: 909-335-9897 | FAX: 909-335-9893

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MANAGEMENT SUMMARY

L&L Environmental, Inc. (L&L) conducted breeding season burrowing owl and raptor nest surveys on Richland Communities' ±207-acre project (and associated offsite improvement areas) in the City of Menifee, California. The purpose of this work effort was to re-examine the subject property to determine presence/absence of burrowing owl and raptor nests on the site and potential for special status species, particularly white-tailed kite, to occur.

L&L has performed studies on this property for over a decade (beginning in 2003) under a number of contractors and proponents. This study reflects the most current field conditions and, where pertinent, makes comparative statements as to past and historic conditions.

Land use varies within and adjacent to the survey area and includes anthropogenic disturbances such as rural residential areas, active and fallow agricultural areas, unimproved roads, powerline easements, off-road vehicle activity, debris piles, and windblown debris. Two (2) roads are present on the property. One is located along the northern and eastern portion of the property where agricultural areas meet less disturbed sage scrub areas. This unimproved road begins at the eastern terminus of Daniel Road and exits at the southeastern corner of the site near the intersection of Evans Road and Ascot Way. Krubsack Road (unimproved) trends north to south through agricultural fields within the roughly west-central portion of the property and connects with Wickerd Road to the south and Daniel Road to the north.

The site consists of agricultural fields and a mix of disturbed to relatively undisturbed buckwheat scrub and chamise chaparral vegetation communities. The agricultural fields are dry farmed for wheat. The site has also been used for sheep grazing in the past, but no grazing was observed during the current survey.

A shallow drainage and mapped blue-line stream is present onsite (trending from south to north within the central portion of the site), as well as various other jurisdictional features. No vernal pools or areas of potential habitat for fairy shrimp were observed or are present onsite.

Based upon presence of relatively flat open areas with low-growing vegetation on large portions of the site, close proximity to a fresh water source, and recent records of burrowing owl in the vicinity, habitat suitable for use by burrowing owl was determined to be present on much of the subject property. There were no burrowing owl observations during biological surveys of the site in 2003, 2004, 2005, 2006, and 2011. L&L conducted focused late-season surveys on the site and surrounding buffer areas in August 2013 with negative results. However, one (1)

location was noted that may have been used in the recent past, based upon presence of a single feather found at an entrance to a hole beneath a grouping of medium-sized rocks. There was a rock immediately adjacent to the entrance that was evidently used for avian perching (species undetermined) based on the presence of droppings, but no other sign, including additional feathers, scat, prey bones, tracks or other indicators were found at the location.

Focused surveys for burrowing owl were not conducted in 2017, but general surveys included searches for burrowing owl and active burrows. No burrowing owl, occupied burrows, or burrowing owl sign were observed. Surveys in 2018 observed one (1) burrowing owl and one (1) active burrow and potential nesting site. The owl was observed during the survey on May 30, but was not observed during subsequent surveys. A preconstruction clearance survey for burrowing owl (valid for 30 days) will be required and winter burrowing owl surveys and preparation of a Burrowing Owl Exclusion Plan are recommended.

A white-tailed kite was observed flying over the site during a survey in 2011, but has not been observed subsequently. The California Natural Diversity Database (CNDDB) has documented occurrences of five (5) white-tailed kite nests within 10 miles of the project site (CDFW 2018c). There are several large eucalyptus trees on and adjacent to the site that may be suitable for raptor nesting. There is a raptor nest onsite in a large eucalyptus tree and it may have been used by red-tailed hawk in the past, but it was not observed to be active in 2017 or 2018. No white-tailed kite nesting has been observed onsite.

Habitat suitable for nesting birds is present within and around the site. Presence of this potential habitat warrants a recommendation for a preconstruction survey for nesting birds prior to any site disturbance during the nesting season (generally February 1 through August 31). If nesting birds are present, avoidance of nest sites will be required and a buffer of at least 500 feet is recommended until juvenile birds have fledged and/or an authorized biologist has verified that the nest is no longer active.

Previous surveys identified one (1) listed species (coastal California gnatcatcher) and several special status species onsite, including white-tailed kite, northern harrier, coast horned lizard, San Diego black-tailed jackrabbit, Cooper's hawk, California horned lark, great blue heron, Costa's hummingbird, and long-spined spineflower.

1.0) INTRODUCTION

The following report was prepared by L&L Environmental, Inc. (L&L) for Richland Communities. It describes the results of biological surveys conducted on a proposed development located on lands within the City of Menifee. The project site consists of APNs 360-300-002, -003, -004, -005, -006, -009, and 360-350-001 (totaling ±207 acres) and portions of offsite APNs 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -024, 360-360-009, -010, -011, and 360-380-004 where improvements are planned.

Our assessment consisted of (1) a records search and literature review, conducted to determine the species of concern in the project area and proximity to closest documented special status species observations, and (2) field reconnaissance to identify presence/absence of habitat and species of concern (particularly burrowing owl and raptor nesting).

1.1) Location

The site is located in the Paloma Valley west of Interstate Highway 215 (I-215), south of Newport Road, and east of Murrieta Road (Figure 1). The site is located between Wickerd Road to the south and Garbani Road to the north. The project site is situated in Sections 15 and 16, Township 6 South, Range 3 West, within the USGS Romoland 7.5' series quadrangle map (Figure 2).

The site is generally bounded as follows: to the west by a mixture of actively cultivated and fallow agricultural areas, Evans Road (unimproved), and rural residential units; to the east by a mixture of disturbed and relatively undisturbed open space, Ascot Way (unimproved), and a Verizon Communications complex beyond; to the north by a mixture of disturbed and relatively undisturbed lands, rural residential areas, Garbani Road (unimproved), and a housing development beyond; and to the south by Wickerd Road (unimproved), rural residential areas, and a mix of disturbed and relatively undisturbed lands beyond (Figure 3).

In addition to surveys conducted on the main site, offsite improvement areas were included in these surveys. These included two (2) separate areas: 1) a 0.5 mile section of Wickerd Road between the southeast corner of the main site east to Haun Road and 2) an area south of the south-central portion of the main site boundary roughly located between the intersection of Wickerd Road and Bradley Road and west to approximately Krubsack Road.

L&L Environmental, Inc.

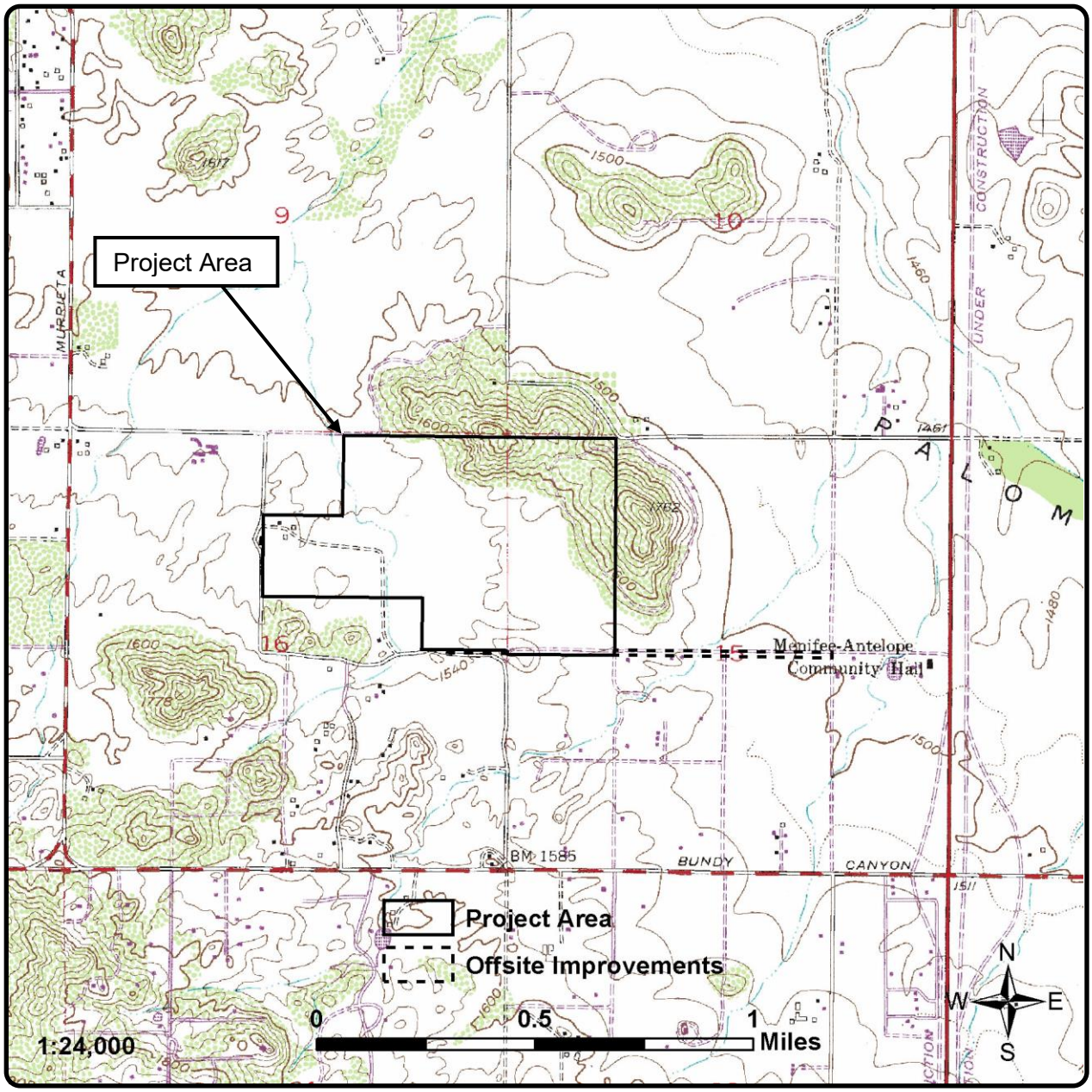
BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
October 2018

Figure 1

Project Vicinity Map

Golden Meadows, TT 31194
City of Menifee, California



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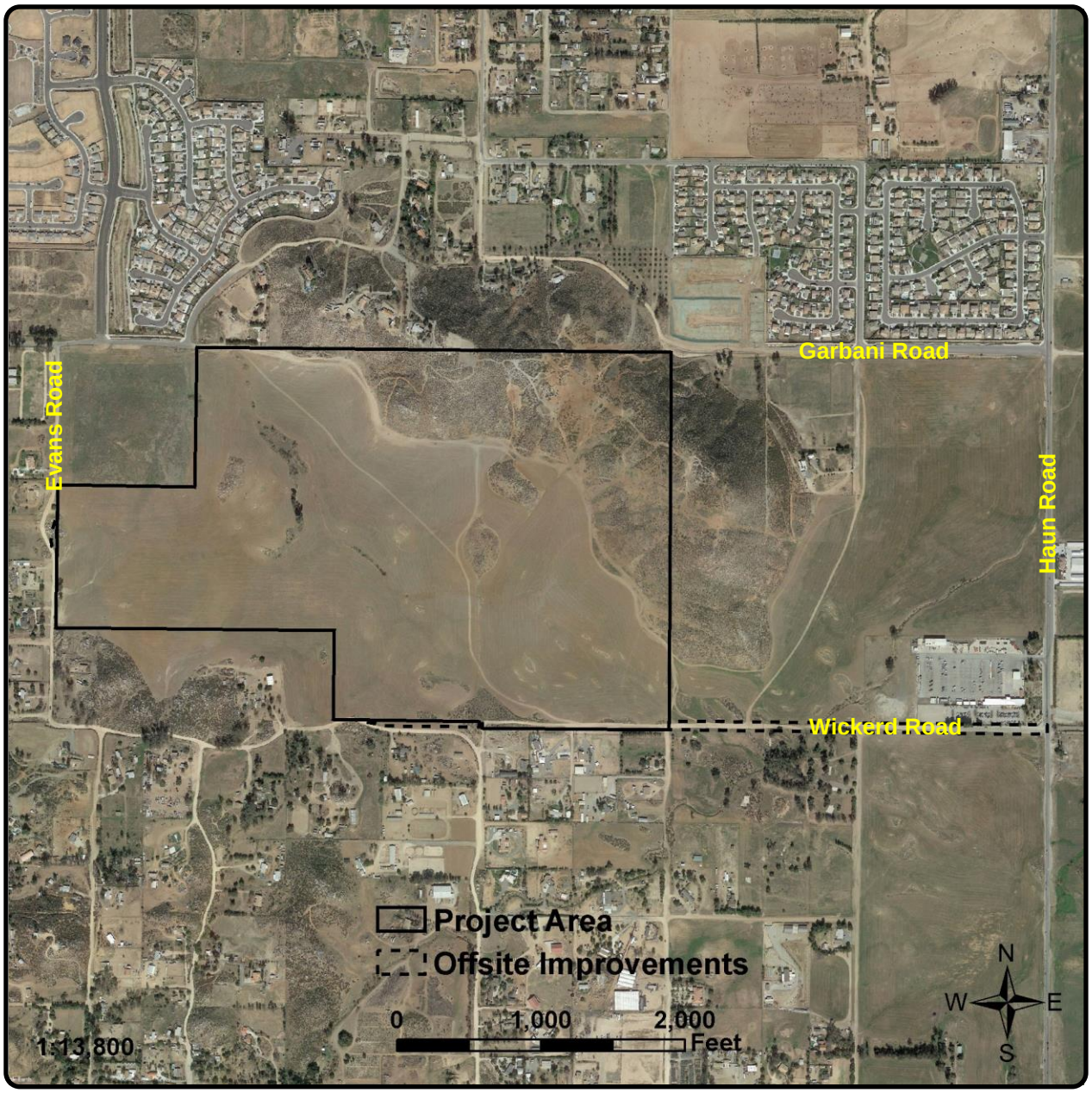
BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
October 2018

Figure 2

Project Location Map
(USGS Romoland 1979 quadrangle,
Sections 15 & 16, Township 6 South, Range 3 West)

Golden Meadows, TT 31194
City of Menifee, California



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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
October 2018

Figure 3

Aerial Photograph
(Photo obtained from Google Earth, February 2018)

Golden Meadows, TT 31194
City of Menifee, California

1.2) Vegetation and Setting

Much of the subject property has been disturbed in association with previous dry-land farming and sheep grazing. As a result, these areas do not support native habitat communities. In the historically less disturbed areas of the property, remnants of California buckwheat scrub and chamise chaparral vegetation are present. Two (2) unimproved roads are present onsite.

A shallow drainage feature and mapped blue-line stream is present trending from the southwest/central to the northwest portion of the site. Much of this area has been impacted by agricultural activities and invasive plants, but several woody riparian species are present in association with this feature.

Land uses adjacent to the survey area include rural residential, agricultural, large animal husbandry, unimproved roads, powerline easements, off-road vehicle activity, storage, and debris piles. An unimproved road begins at the eastern terminus of Daniel Road and exits at the southeastern corner of the site near the Evans Road and Ascot Way intersection. Krubsack Road (unimproved) runs north-south through agricultural fields within the roughly west-central portion of the property and connects with Wickerd Road to the south and Daniel Road to the north.

The agricultural fields are dry farmed for wheat. During 2018 surveys, the wheat crop appeared to have been mown/harvested early in the spring, prior to the start of surveys. The site has also been used for sheep grazing in the past, but no grazing was observed during the 2018 survey.

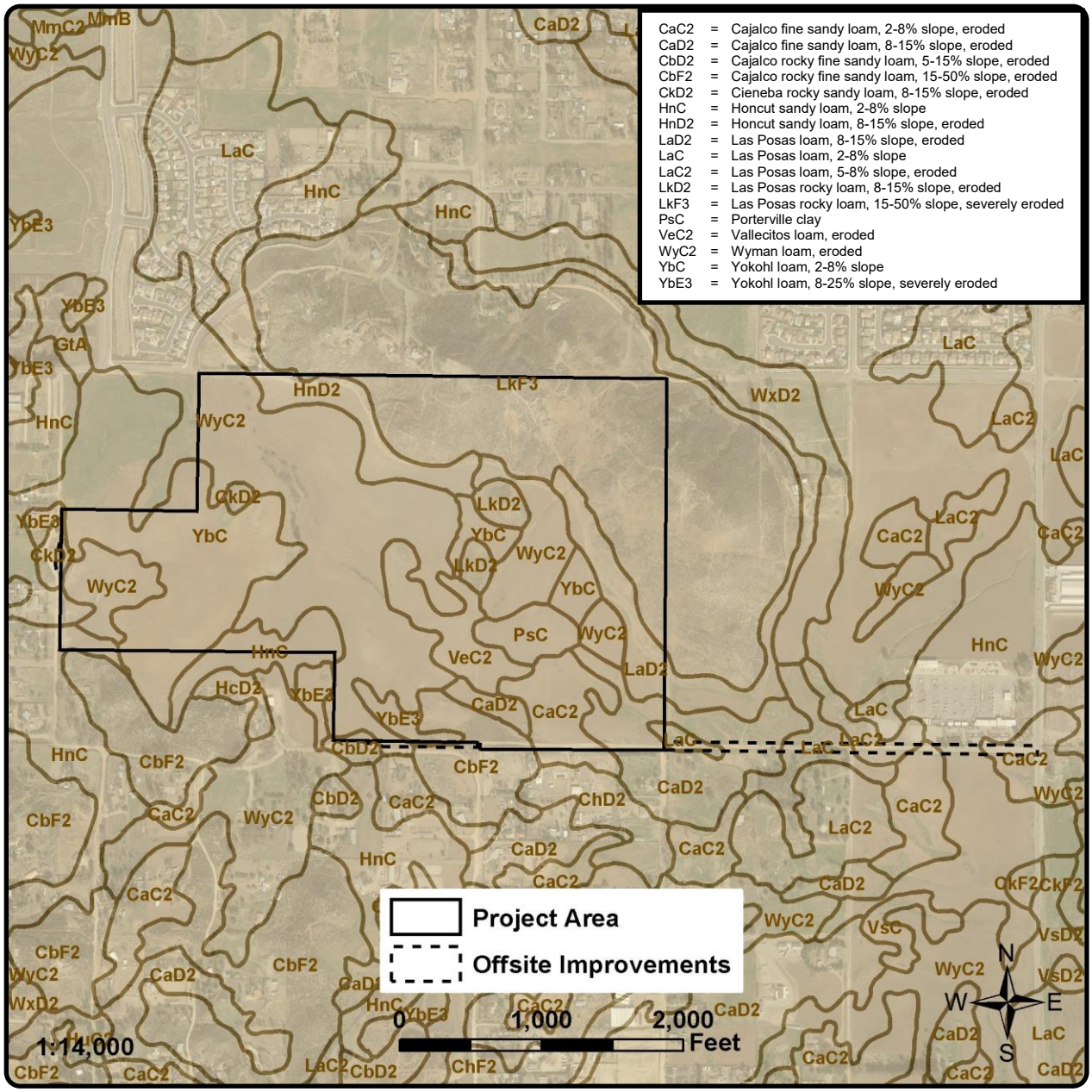
1.3) Soils and Topography

Soils on the project site were mapped by the Natural Resources Conservation Service (2018) as a mixture of several soil types, including Wyman loam (WyC2), Vallecitos loam (VeC2), Porterville clay (PsC), Yokohl loam (YbC and YbE3), Cajalco fine sandy loam (CaC2 and CaD2), Cajalco rocky fine sandy loam (CbF2), Honcut sandy loam (HnC and HnD2), Las Posas loam (LaD2), and Las Posas rocky loam (LkD2 and LkF3) (Figure 4). The most common soils mapped for the subject property are Wyman loam on the central and western portion of the site (in farmed areas) and Las Posas rocky loams on densely vegetated hillsides within the northern and eastern portions of the site. Clay soils are relatively uncommon on the site, but Porterville clay is present near the southeastern portion of the property within the agricultural areas. Soils observed onsite range from mostly sandy-loamy within the farmed areas to rocky loamy on the

less disturbed vegetated hillsides. Cryptobiotic crusts are present, but only within less disturbed portions of the site away from previously farmed areas.

Topographically, much of the site is primarily flat and contains open lands with low-relief rocky outcrops and shallow depressions. Gently to steeply sloping hills and ridgelines are present within the northeastern portion of the property. The site has a combined maximum vertical relief of roughly 220 feet between highest and lowest points on the property, with elevation ranging from approximately 1,500 to 1,720 feet above mean sea level (AMSL).

Surrounding topographic features in the project vicinity include gently to steeply sloping hills and ridgelines interspersed with lower-lying relatively flat areas. Although most surrounding areas of the Paloma Valley are primarily flat, significant topographic features are present northwest and southwest of the property at elevations of approximately 1,760 to 1,820 feet AMSL. Bell Mountain, a significant topographic feature located approximately two (2) miles east of the subject property, rises to 1,848 feet AMSL.



L&L Environmental, Inc.

BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
October 2018

Figure 4

Soils Map

(Photo obtained from Google Earth, February 2016, USDA Nat. Res. Cons. Serv. SSURGO Data)

Golden Meadows, TT 31194
City of Menifee, California

2.0) REGULATORY ENVIRONMENT

2.1) Federal

2.1.1) Federal Endangered Species Act

By law, it is a requirement of the federal Endangered Species Act (FESA), 1973 (as amended) at Section 7(a)(2) that federal agencies ensure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat. In order to comply with this requirement, the federal agency must conduct a Biological Assessment (BA), in which effects to listed species are analyzed and disclosed in the form of an "effects determination."

Section 7 requires federal agencies to consult with the U. S. Fish and Wildlife Service (USFWS) should it be determined that their actions may affect federally listed threatened or endangered species. Section 9 of FESA prohibits "take" (e.g., harm, harassment, pursuit, injury, kill) of federally listed wildlife. "Harm" is further defined to include habitat modification or degradation where it kills or injures wildlife by impairing essential behavioral patterns such including breeding, feeding, or sheltering. Take that is incidental to otherwise lawful activities can be authorized under Section 7 of FESA.

Procedures for obtaining a permit for incidental take are identified under Section 7 of FESA for federal properties or where federal actions are involved and are identified under Section 10 of FESA for non-federal actions. During the Section 7 process, measures to avoid and minimize project effects to listed species and their habitat will be identified and incorporated into a Biological Opinion (prepared by the USFWS) that includes an incidental take by the federal agency and applicant.

The County of Riverside has been issued a Section 10(a) permit for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), discussed below.

2.1.2) Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711) is an international treaty that makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Executive Order 13186 ensures that

environmental analyses of federal actions required by the National Environmental Policy Act (NEPA) or other established environmental review processes evaluate the effects of actions on migratory birds, with emphasis on species of concern. Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) or loss of habitat upon which the birds depend could be considered "take" and constitute a violation of the MBTA.

2.2) State

2.2.1) California Endangered Species Act

California Endangered Species Act (CESA) definitions of endangered and threatened species parallel those defined in the FESA. The CESA defines an endangered species as ". . . a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes including loss of habitat, change in habitat, overexploitation, predation, competition or disease." Endangered species are in serious danger of becoming extinct and threatened species are likely to become endangered species in the foreseeable future (according to Sections 2062 and 2067, respectively, of the California Fish and Game Code). Candidate species are those under formal review by the CDFW for listing as endangered or threatened (Section 2067). Prior to being considered for protected status, the CDFW designates a species as being of special concern. Species of Special Concern are wildlife species for which the CDFW has information indicating population decline. Plant species of concern are designated by California Rare Plant Ranks.

2.2.2) California Natural Diversity Database

The California Natural Diversity Database (CNDDB) includes documented occurrences of special status species that have been reported to the CDFW. It also includes ranks of overall condition of sensitive species and vegetation communities on global (throughout its range) and state (within California) levels. State ranking is numerical, ranging from one to five (S1 to S5), with one indicating very few remaining individuals or little remaining habitat and five indicating a demonstrably secure to ineradicable population condition.

2.2.3) California Rare Plant Ranks

The California Native Plant Society (CNPS) Inventory of Rare and Endangered Species includes documented occurrences of special status plant species that are available through the

Consortium of California Herbaria and other sources. The CNPS, in coordination with CDFW, has cataloged California's rare and endangered plants into lists according to population distributions and viability. These lists are numbered and indicate the following California Rare Plant Ranks (CRPR): (1A) presumed extinct in California; (1B) rare, threatened, or endangered throughout their range; (2A) presumed extirpated in California, but more common in other states; (2B) threatened or endangered in California, but more common in other states; (3) more information is needed to establish rarity; and (4) plants of limited distribution in California (i.e., naturally rare in the wild), but whose populations do not appear to be susceptible to threat. A CRPR may also have an extension (e.g., 1B.x) that indicates current level of threat: seriously threatened (x.1), moderately threatened (x.2), or not very threatened (x.3).

2.2.2) California Environmental Quality Act

The California Environmental Quality Act (CEQA) and CEQA Guidelines (§ 15000 et seq.) require identification of environmental effects from discretionary projects. Significant effects are to be mitigated by avoidance, minimization, rectification, or compensation whenever possible.

Effects to all state and federal listed species are considered significant under CEQA. In addition to formally listed species, CEQA considers effects to species that are demonstrably endangered or rare as important or significant. These definitions can include state designated species of special concern, federal candidate and proposed species, CNDDB tracked species, and CRPR list 1B and list 2 plants.

Appendix G of the CEQA Guidelines specifically addresses biological resources and encompasses a broad range of resources to be considered.

2.2.3) California Fish and Game Code, Sections 3503 and 3513

California Fish and Game Code Section 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; Section 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and Section 3513 provides for the adoption of the provisions of the federal Migratory Bird Treaty Act.

2.3) Local

2.3.1) Western Riverside County Multiple Species Habitat Conservation Plan

The County of Riverside, including eight (8) additional land jurisdictions and 14 cities, have prepared a Multiple Species Habitat Conservation Plan (MSHCP) for western Riverside County. The MSHCP will build upon existing preserves and provide connectivity and wildlife corridors throughout the region. The MSHCP proposes to conserve approximately 500,000 acres and 146 different species. Approximately 347,000 acres are anticipated to be conserved on existing Public/Quasi-Public lands with additional contributions of approximately 153,000 acres from willing sellers (http://www.rcip.org).

The MSHCP was approved by the county on June 17, 2003 and an Implementation Agreement (IA) between the USFWS, the CDFW, and the County was executed and an associated USFWS Section 10(a)(1)(B) Permit (No. TE-088609) was issued on June 22, 2004. The permit grants take authorization for certain species identified in the permit as "Covered Species Adequately Conserved."

The MSHCP establishes seven (7) core reserve areas and associated linkages between proposed and existing core areas. The MSHCP divides areas into Cells using USGS coordinates. According to the Riverside County Integrated Project website, parcels that compose the current project site are located within Sun City/Menifee Valley Area Plan. Conservation efforts for the project site will be evaluated with regard to sensitive species identified as not adequately conserved and observed onsite, riverine/riparian or vernal pool habitat and their associated sensitive species (if located onsite), fairy shrimp, jurisdictional areas, and sage scrub.

Focused surveys are required for species identified as not adequately conserved under the MSHCP if suitable habitat is present onsite. If focused surveys are determined necessary and species identified as not adequately conserved under the MSHCP occur onsite, the proponent may be required to undergo a Habitat Acquisition and Negotiation Strategy (HANS) determination with the County of Riverside. If a single family home or mobile home is to be placed on an existing legal lot, permitting will be reviewed according to the procedures outlined in MSHCP Section 6.1.1, *Expedited Review Process for Single-Family Homes or Mobile Homes To Be Located on an Existing Lot Within the Criteria Area*.

Section B (Species Accounts) of Volume 2 of the MSHCP (Dudek 2003) lists the following objectives for burrowing owl conservation/protection:

Objective 1

Include within the MSHCP Conservation Area at least 27,470 acres of suitable primary habitat for the burrowing owl including grasslands.

Objective 2

Include within the MSHCP Conservation Area at least 5 Core Areas and interconnecting linkages. Core areas may include the following: (1) Lake Skinner/Diamond Valley Lake area (Existing Core C plus Proposed Extension of Existing Cores 5, 6, 7; 29,060 acres); (2) playa west of Hemet (Proposed Noncontiguous Habitat Block 7; 1,250 acres); (3) San Jacinto Wildlife Area/Mystic Lake area including Lake Perris area (Existing Core H; 17,470 acres); (4) Lake Mathews (Existing Core C plus Proposed Extension of Existing Cores 2; 23,710 acres); and (5) along the Santa Ana River (9,670 acres). The Core Areas should support a combined total breeding population of approximately 120 burrowing owls with no fewer than five pairs in any one Core area.

Objective 3

Include within the MSHCP Conservation Area at least 22,120 acres of suitable secondary habitat for the burrowing owl including playas and vernal pools, and agriculture outside of the Core Areas identified above. Areas where additional suitable habitat could be conserved include west of the Jurupa Mountains, near Temescal Wash (i.e., vicinity of Alberhill), near Temecula Creek, within the Lakeview Mountains, Banning, the Badlands, Gavilan Hills, and Quail Valley.

Objective 4

Include within the MSHCP Conservation Area the known nesting locations of the burrowing owl at Lake Perris, Mystic Lake/San Jacinto Wildlife area, Lake Skinner area, the area around Diamond Valley Lake, playa west of Hemet, Lakeview Mountains, Lake Mathews/Estelle Mountain Reserve and Sycamore Canyon Regional Park.

Objective 5

Surveys for burrowing owl will be conducted as part of the project review process for public and private projects within the burrowing owl survey area where suitable habitat is present (see Burrowing Owl Survey Area Map, Figure 6-4 of the MSHCP, Volume I). The locations of this species determined as a result of survey efforts shall be conserved in accordance with procedures described within Section 6.3.2, MSHCP, Volume I and the guidance provided below:

Burrowing owl surveys shall be conducted utilizing accepted protocols as follows. If burrowing owls are detected on the project site then the action(s) taken will be as follows:

If the site is within the Criteria Area, then at least 90 percent of the area with long-term conservation value will be included in the MSHCP Conservation Area. Otherwise:

1) If the site contains, or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and the

surrounding area supports fewer than 3 pairs of burrowing owls, then the on-site burrowing owls will be passively or actively relocated following accepted protocols.

2) If the site (including adjacent areas) supports three or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs will be conserved onsite.

The survey and conservation requirements stated in this objective will be eliminated when it is demonstrated that Objectives 1 – 4 have been met.

Objective 6

Pre-construction presence/absence surveys for burrowing owl within the survey area where suitable habitat is present will be conducted for all Covered Activities through the life of the permit. Surveys will be conducted within 30 days prior to disturbance. Take of active nests will be avoided. Passive relocation (use of one-way doors and collapse of burrows) will occur when owls are present outside the nesting season.

Objective 7

Translocation sites for the burrowing owl will be created in the MSHCP Conservation Area for the establishment of new colonies. Translocation sites will be identified, taking into consideration unoccupied habitat areas, presence of burrowing mammals to provide suitable burrow sites, existing colonies and effects to other Covered Species. Reserve Managers will consult with the Wildlife Agencies regarding site selection prior to translocation site development.

3.0) METHODS AND PERSONNEL

3.1) Literature Review

Pertinent literature was reviewed to identify local occurrences and habitat requirements of special status species and communities occurring in the region. Literature reviewed included compendia provided by resource agencies (CDFW 2018a, 2018b; USFWS 2018), the Western Riverside County MSHCP (Dudek 2003), California Natural Diversity Database (CNDDB; CDFW 2018c) reports for the vicinity, and reports of previous surveys completed for the site (L&L 2003-2018).

Latin names of plants follow *The Jepson Manual* (Hickman 1993) with updates from the online Jepson eFlora (Jepson 2018). Latin names of animals follow *A Field Guide to Western Reptiles and Amphibians* (Stebbins 1985), *California Mammals* (Jameson and Peeters 1988), *Checklist of North American Birds* (American Ornithologists' Union 1983, 1989) and *The Sibley Guide to Birds* (Sibley 2000), and *American Insects: A Handbook of the Insects of America North of Mexico* (Arnett 2000). Vegetation community classifications follow Sawyer et al. (2009). Current conservation status of plant and wildlife species determined from CDFW (2018a, 2018b). Other sources consulted for information regarding biological resources include Brown (1994), Recon (1985), Schoenherr (1990), and Small (1994).

3.2) Survey Methods

A habitat assessment, burrow survey, and focused burrowing owl surveys were conducted on four (4) site visits in May, June, and July 2018 (Table 1). The surveys were conducted in accordance with the Burrowing Owl Survey Instructions for the MSHCP. In addition, the site was examined to determine the possible presence/absence of nesting raptors on the property, in particular white-tailed kite.

MSHCP Burrowing Owl Survey Instructions require surveys to be conducted during the breeding season from March 1 to August 31. Surveys should be conducted during weather conditions that are conducive to detecting owls and owl sign. Surveys are not acceptable if they are conducted during rain, high winds (> 20 mph), dense fog, or temperatures over 90° F.

Surveys should be conducted in the morning one (1) hour before sunrise to two (2) hours after sunrise or in the early evening two (2) hours before sunset to one (1) hour after sunset. Surveys were generally conducted in the early morning hours.

Surveys were conducted by L&L field biologist Guy Bruyea. Mr Bruyea has extensive experience with surveys for burrowing owl and nesting birds. Weather conditions during the surveys are summarized in Table 1.

Table 1. Survey Information.

Date	Time	Sunrise*	Weather	Wind (mph)
05.24.2018	1030-1330	0545	Partly cloudy, 77-82º F	1-3
05.30.2018	0700-1030	0543	Cloudy, 68-77º F	0-4
06.14.2018	0730-1100	0541	Sunny/Clear, 76-87º F	3-8
07.04.2018	0700-1000	0546	Sunny/Clear, 74-86º F	0-2

*sunrise times from timeanddate.com

A total of about 13 person-hours were spent onsite. The site was examined for suitable burrow sites and for signs of occupation by BUOW, including pellets, feathers, whitewash, prey remains, and eggshell fragments, as well as individual BUOW. A search for potentially suitable burrows within dirt, wood, and rock debris piles, artificially created berms, and other locations was conducted during the surveys. The surveys were concentrated in areas typically associated with BUOW habitat, including open areas onsite and areas where California ground squirrel activity (i.e., suitable burrows) was expected. An additional 150-meter (500-foot) buffer area surrounding the site was visually inspected, where possible, in areas identified as potential BUOW habitat. Any developed areas were visually surveyed with binoculars due to trespassing concerns on private property.

Transects were walked throughout the property where suitable habitat is present. Coupled with binocular surveys of any restricted areas, this allowed for complete visual ground coverage of the survey area. Distance between transects was approximately 15 to 20 meters.

After discovery of the active burrowing owl burrow on May 30, subsequent surveys included time spent surveilling the burrow, from a distance, for any activity or additional sightings of burrowing owl adults or young.

In addition, the site was examined to determine the possible presence/absence of nesting raptors on the property, in particular white-tailed kite. This survey primarily focused on examining trees on and within 500 feet of the project site for evidence of raptor nesting.

3.3) Species Information

3.3.1) Burrowing Owl

Burrowing owl (*Athene cunicularia*) is protected under the federal Migratory Bird Treaty Act and California Fish and Game Code and is a CDFW Species of Special Concern. Under the MSHCP, surveys are required in certain areas and mitigation is required as described in Section 2.3.

Burrowing owl is a small, ground-dwelling owl found in open dry grassland, desert, or shrubland areas and in uncultivated agricultural areas, rangelands, and other open areas with low-growing vegetation. It ranges throughout the western U. S., Canada, and Mexico. It is a small (approximately 9 to 11 inches in height) pale brown owl with white-colored "eyebrows" and throat, yellow eyes, a short stubby tail, and long legs. Males are generally larger and more lightly colored than females. Burrowing owl is the most diurnal of owl species, but is considered mostly crepuscular (usually active around sunrise and sunset). Arthropods (mainly beetles and grasshoppers) make up a large portion of their diet, especially during the breeding season. Burrowing owls are opportunistic feeders and will readily eat small mammals (primarily mice, gophers, and ground squirrels), lizards, amphibians, and small birds.

Burrows are an essential element of burrowing owl habitat. Although burrowing owls can excavate their own burrows in soft soils, they typically inhabit abandoned burrows of small burrowing mammals, such as ground squirrels and pocket gophers. Burrowing owl has also been known to use man-made structures such as cement culverts, debris piles, and other artificial burrows. Occupancy of burrowing owl habitat can be verified at a site by observation of at least one (1) owl or its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance (CBOC 1993).

A site is considered occupied if at least one (1) owl has been identified onsite in the past three (3) years, because (if undisturbed) burrowing owls "exhibit high site fidelity, reusing burrows year after year" (Rich 1984, Feeny 1992). The range of this species is throughout the western United States and Mexico, but it is increasingly uncommon in southern California.

3.3.2) White-tailed Kite

White-tailed kite (*Elanus leucurus*) is a CDFW Fully Protected species. The classification of Fully Protected was California's initial effort to identify and protect rare wildlife species.

With a few exceptions, Fully Protected species have subsequently been listed under the California and/or Federal Endangered Species Acts. One of the exceptions is white-tailed kite, which is not state or federally listed, but retains its Fully Protected status.

The white-tailed kite forages in open grasslands, farmlands, meadows, and wetlands. Nests are located near foraging areas in substantial groves of dense, broad-leafed trees. Nests are built near the top of oaks, willows, or other trees, usually between 20 to 100 feet above the ground. The nest is composed of loosely piled sticks, lined with grass, straw, or rootlets. White-tailed kite breeds from February to October, with a peak from May to August (Zeiner et al. 1990).

4.0) RESULTS

4.1) Literature Review Results

The project site is within the area covered by the Western Riverside County MSHCP. The MSHCP Conservation Summary Report identified the site as requiring an assessment with regard to potential habitat and presence/absence of burrowing owl. This and previous reports fulfill the MSHCP requirement of habitat assessment and presence/absence surveys for burrowing owl. Figure 5 shows the project site in relation to MSHCP core areas and linkages.

The 2006 Final Environmental Impact Report (EIR) for the project (T&B 2006) includes a mitigation measure (4.3-2) requiring a pre-construction survey for burrowing owl within 30 days prior to grading. If burrowing owl is present, mitigation is required per the MSHCP:

> If the site contains or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and surrounding area supports less than 3 pairs of burrowing owls, then the on-site burrowing owls shall be passively or actively relocated following accepted protocols.
>
> If the site (including adjacent areas) supports 3 or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs shall be conserved on-site.

The EIR also includes a mitigation measure (4.3-5) requiring a nesting raptor survey prior to issuance of grading permits and a CDFW Incidental Take Permit (2080 permit) if white-tailed kite are documented as nesting on the project site.

The CNDDB (CDFW 2018c) has documented occurrences of five (5) white-tailed kite nests within 10 miles of the project site (Figure 6):

> Occurrence 38 is approximately 9.3 miles south-southwest of the project site. The occurrence is located at the Santa Rosa Plateau Preserve within oak savannah and native grassland at an elevation of 1,950 feet. Successful nesting was last documented in 1988 and 1989 and the occurrence is presumed extant. Google Earth images show undisturbed habitat present in that area.

Occurrence 39 is approximately 9.2 miles southwest of the project site. The occurrence is described as located on private land between two (2) parcels of Santa Rosa Plateau Preserve property. The habitat is oak savannah and native grassland at an elevation of 1,820 feet. The nest was last observed in 1989 (active nest, outcome unknown) and noted as threatened by proposed development. Examination of Google Earth images shows undisturbed habitat present in that area. The occurrence is presumed extant.

Occurrence 62 is approximately 7.5 miles southeast of the project site in Murrieta. The occurrence is located in southern riparian scrub habitat at an elevation of 1,240 feet. The record notes that the area was proposed for development, and Google Earth images now show the occurrence within a narrow area of habitat surrounded by residential developments. A pair of white-tailed kites was last observed in 1999. The occurrence is presumed extant.

Occurrence 112 is approximately 9.4 miles west-northwest of the project site and just north of Lake Elsinore. The occurrence is located in willow riparian woodland at an elevation of 1,258 feet. Successful nesting was documented in 2006. Google Earth images show undisturbed habitat at that location. The occurrence is presumed extant.

Occurrence 115 is approximately 7.1 miles northeast of the project site. The occurrence is located in a small grove of trees associated with a rural residence in Winchester, north of Diamond Valley Lake. Agricultural fields are also present in the area. Successful nesting was documented in 2005 and 2006. Google Earth images show trees and agricultural fields remain in the area, as described in the CNDDB record. The occurrence is presumed extant.

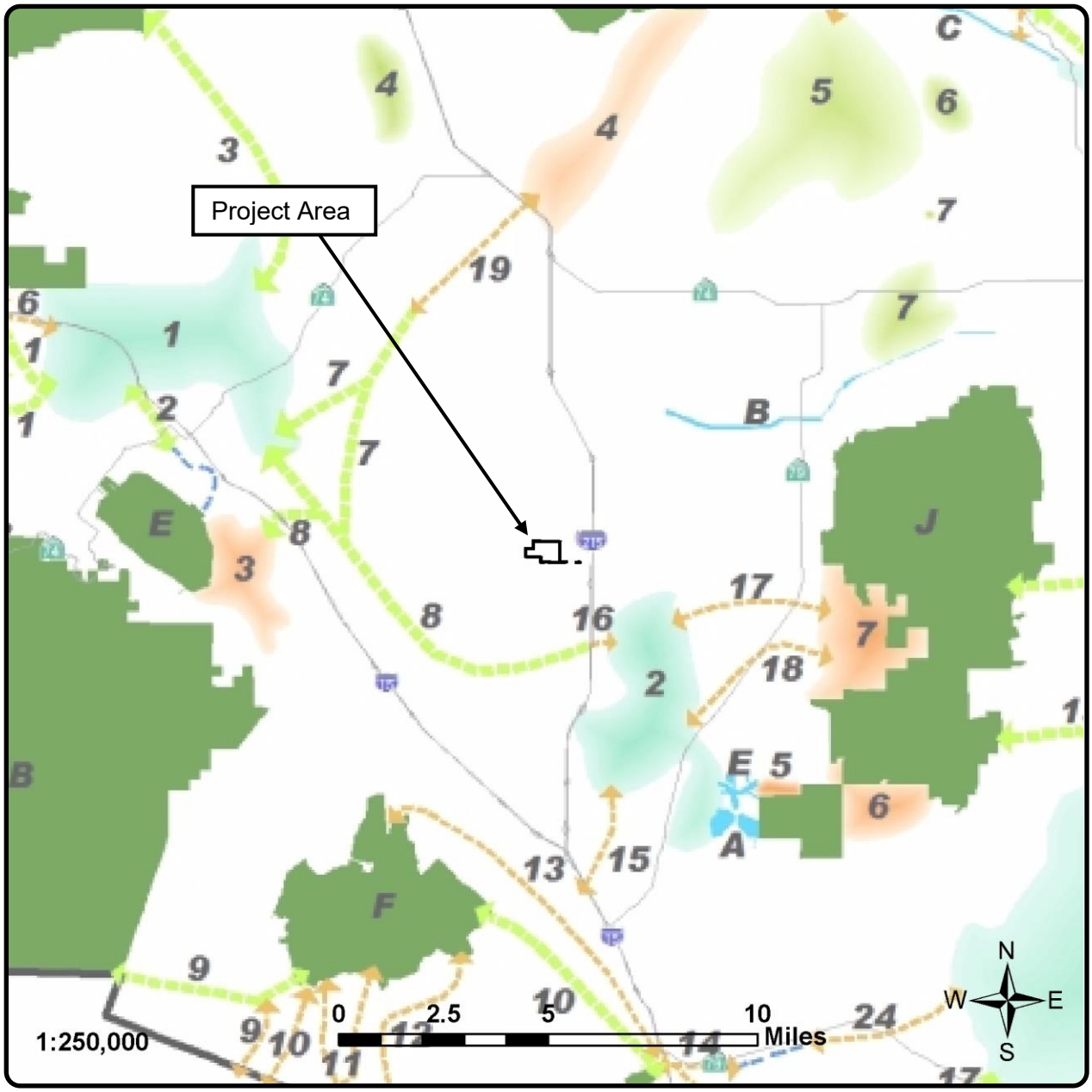


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Figure 5

MSHCP Cores and Linkages
(Riverside County MSHCP)

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Figure 6

White-tailed Kite within 10 Miles

CDFW 2018c

Golden Meadows, TT 31194
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4.2) Vegetation Communities

Much of the subject property has been disturbed by recent and historic cultivation and sheep grazing and does not support native habitat. The agricultural fields are dry farmed for wheat. During 2018 surveys, the wheat crop appeared to have been mown/harvested early in the spring, prior to the start of surveys.

Less disturbed areas are also present, primarily in the northeastern portions of the site, with a mixture of disturbed and relatively undisturbed California buckwheat scrub and chamise chaparral. Sparse riparian vegetation and trees are found along the blue-line stream in the northwestern/central portion of the site (Figure 7).

Evidence of widespread sheep grazing was observed throughout all areas of the site in 2013. Hillsides containing California buckwheat scrub along the farmland edges, especially to the north and east, had been severely damaged by sheep grazing. Very few annuals remained (none in some areas) and many of the perennials have been stripped of vegetation and/or trampled. No evidence of recent sheep grazing was observed during surveys in 2017 and 2018 and regrowth of native annuals and perennials was observed in the buckwheat scrub areas.

Relatively undisturbed California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance) is present on the eastern and northern (primarily northeastern) portion of the site on south, west, and east-facing slopes containing numerous rocky outcrops. Native shrubs and other conspicuous plants commonly observed in these areas include California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemisia californica*), white sage (*Salvia apiana*), brittlebush (*Encelia farinosa*), yellow bush penstemon (*Keckiella antirrhinoides*), wishbone bush (*Mirabilis laevis* var. *crassifolia*), sweetbush (*Bebbia juncea*), blue elderberry (*Sambucus nigra* ssp. *cerulea*), and black sage (*Salvia mellifera*). Approximately 44.2 acres of California buckwheat scrub is present onsite and an additional ±0.6 acre is located within offsite improvement areas. Open patches can be found throughout portions of the buckwheat scrub onsite containing a mixture of native and non-native annuals. This vegetation community is ranked by CDFW (2018d) as S5 (secure – common, widespread, and abundant) and it is not considered sensitive.

Chamise chaparral (*Adenostema fasciculatum* Shrubland Alliance) or chamise–black sage chaparral (*Adenostema fasciculatum–Salvia mellifera* Shrubland Alliance) is found mainly in small patches of remnant habitat, excluding the east-central property boundary where some relatively dense stands remain and mix with California buckwheat scrub. Common species

found in the chaparral areas onsite are chamise (*Adenostoma fasciculatum*), black sage, and other perennials. Approximately ±2.1 acres of chaparral are present onsite, with an additional ±0.6 acre located within offsite improvement areas. CDFW ranks these chaparral communities as S5 and they are not considered sensitive.

Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance) and mulefat thickets (*Baccharis salicifolia* Shrubland Alliance) are present along a degraded blue-line stream in the northwestern/central portions of the site. This area is sparsely inhabited by arroyo willow (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), or a combination of these species. A single Fremont cottonwood tree (*Populus fremontii* ssp. *fremontii*) and scattered non-native tamarisks (*Tamarix* species) were also observed. The understory is dominated by mostly weedy annuals. Approximately 2.3 acres of this habitat is present onsite. CDFW ranks both of these communities as S4 (apparently secure – uncommon but not rare, some cause for long-term concern due to declines or other factors) and they are not considered sensitive.

Approximately 75 percent of the site is composed of agricultural areas under cultivation for wheat. During 2018 surveys, the wheat crop appeared to have been mown/harvested early in the spring, prior to the start of surveys. Weedy annuals, mostly mustards, have proliferated in the fields. Disturbed habitat on the site includes unvegetated areas (such as roads) and areas that contain mostly non-native plant species, including ornamentals and ruderal invasive species. There are ±158.5 acres of disturbed and/or agricultural land onsite, with an additional ±2.5 acres within offsite improvement areas.

4.3) Plant Species

Under the MSHCP, no surveys or assessments were required for Narrow Endemic, Criteria Area, or additional needs botanical species on the project site. The site does not support habitat, soils, and/or vegetation associated with naturally occurring vernal pools and would therefore not support associated special status plant species, nor were these species observed.

One (1) special status plant species was observed onsite in 2017, long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*; CRPR 1B.2). Two (2) plants were observed on clay soils in the northeast portion of the site along an east-west ridgeline. Under the MSHCP, this species is considered to be adequately conserved.

A list of all plant species identified onsite during past and present surveys is included in Appendix A.

4.4) Wildlife Species

A combined total of 59 wildlife species have been detected during all biological surveys of the site by L&L. A list of all wildlife species identified onsite is provided in Appendix A.

Biological surveys conducted on the project site by L&L from 2003 to 2017 (L&L 2003a, 2003b, 2004a, 2004b, 2004c, 2005, 2006a, 2006b, 2007, 2011, 2013, 2017) detected the following special status species (Figures 8 through 10):

- coastal California gnatcatcher (*Polioptila californica californica*; federal threatened, CDFW Species of Special Concern, MSHCP Adequately Conserved),
- white-tailed kite (*Elanus leucurus*; California Fully Protected, MSHCP Adequately Conserved),
- coast horned lizard (*Phrynosoma blainvillii*; CDFW Species of Special Concern, MSHCP Adequately Conserved),
- coastal (western) whiptail (*Aspidoscelis tigris stejnegeri*; CDFW Species of Special Concern, MSHCP Adequately Conserved),
- northern harrier (*Circus cyaneus*; CDFW Species of Special Concern, MSHCP Adequately Conserved),
- San Diego black-tailed jackrabbit (*Lepus californicus bennetti*; CDFW Species of Special Concern, MSHCP Adequately Conserved),
- orange-throated whiptail (*Aspidoscelis hyperythra*; CDFW Watch List, MSHCP Adequately Conserved),
- Cooper's hawk (*Accipiter cooperi*; CDFW Watch List, MSHCP Adequately Conserved),
- California horned lark (*Eremophila alpestris actia*; CDFW Watch List, MSHCP Adequately Conserved),
- Costa's hummingbird (*Calypte costae*; CDFW Special Animal, not covered by MSHCP).
- great blue heron (fly over) (*Ardea herodias*; CDFW Special Animal, MSHCP Adequately Conserved),

All of these species are considered Adequately Conserved under the MSHCP except Costa's hummingbird, which is not covered under the MSHCP.

Four (4) special status species were observed or detected during the current survey (Figure 11): burrowing owl, coastal California gnatcatcher, California horned lark, and black-tailed jackrabbit. All were previously observed onsite, except burrowing owl.

4.4.1) Burrowing Owl

Previous focused surveys for burrowing owl (2005, 2006, 2007, 2011, and 2013) did not detect burrowing owls utilizing the site. However, one (1) location may have been used in the relatively recent past, based on presence of a single feather found during the 2013 survey at an entrance to a hole beneath a grouping of medium-sized rocks. No burrowing owl or sign was observed during 2017 general biological surveys.

Focused surveys in 2018 observed a single burrowing owl onsite and one (1) burrow with signs of occupation (Figure 11). The owl was observed on May 30, 2018. The occupied burrow was found very close to where the owl was observed. Pellets, scat, feathers, owl tracks, and pieces of shredded cloth were observed at the burrow entrance. It was not determined if the owl was using the burrow for nesting purposes. The burrow was surveilled during subsequent site visits, but there were no additional observations of burrowing owl adults or juveniles. Coyote and/or dog tracks were observed around the burrow, but the burrow itself was not disturbed and there were no signs that owls had been predated. No other active burrows or burrowing owls were observed during surveys.

California ground squirrel activity onsite has increased substantially from that observed in 2017, possibly due to a recent reduction in disturbance associated with farming (i.e., mowing the crop early and leaving the fields undisturbed afterward). This has led to an increase in potential burrows for burrowing owl.

4.4.2) Raptor Nests

One (1) white-tailed kite was observed flying over the property in 2011. This species was not observed utilizing the site for foraging or nesting during previous surveys.

There is habitat suitable for nesting birds (including raptors) within and around the site. Some relatively large eucalyptus trees are present on the western portion of the site and along the western boundary along Evans Road. Red-tailed hawks (*Buteo jamaicensis*) have been observed onsite and may be utilizing the trees for nesting.

A potential (unoccupied) raptor nest site was found in a large eucalyptus tree within the central portion of the site in 2013. It is located in a eucalyptus tree in the west-central portion of the site (Figure 11). No raptors were observed utilizing the nest site during surveys in 2013 and 2017 or

the current survey. Although potentially suitable habitat is present, there is no evidence that white-tailed kite is using the site for nesting.

4.5) Jurisdictional Areas (MSHCP Riparian/Riverine and Vernal Pool Habitat)

The subject site contains woody, water-dependent vegetation. Arroyo willow, Fremont cottonwood, and mulefat are present within the mapped features (Figure 12). An ephemeral stream is present and mapped as a USGS blue-line stream. Surface water was not observed within any of the onsite drainage features during the 2013 or 2017 surveys. An updated jurisdictional delineation was completed in 2011, revised in 2013, and updated and verified in 2018 (L&L 2011, 2018).

Soil types within the study area are not consistent with an alkali playa or vernal pool complex and pools or depressions characteristic of vernal pool habitat were not noted as present onsite. No MSHCP species listed for protection associated with riparian/riverine areas and vernal pools were observed. No fairy shrimp or potential fairy shrimp habitat was observed during this study.

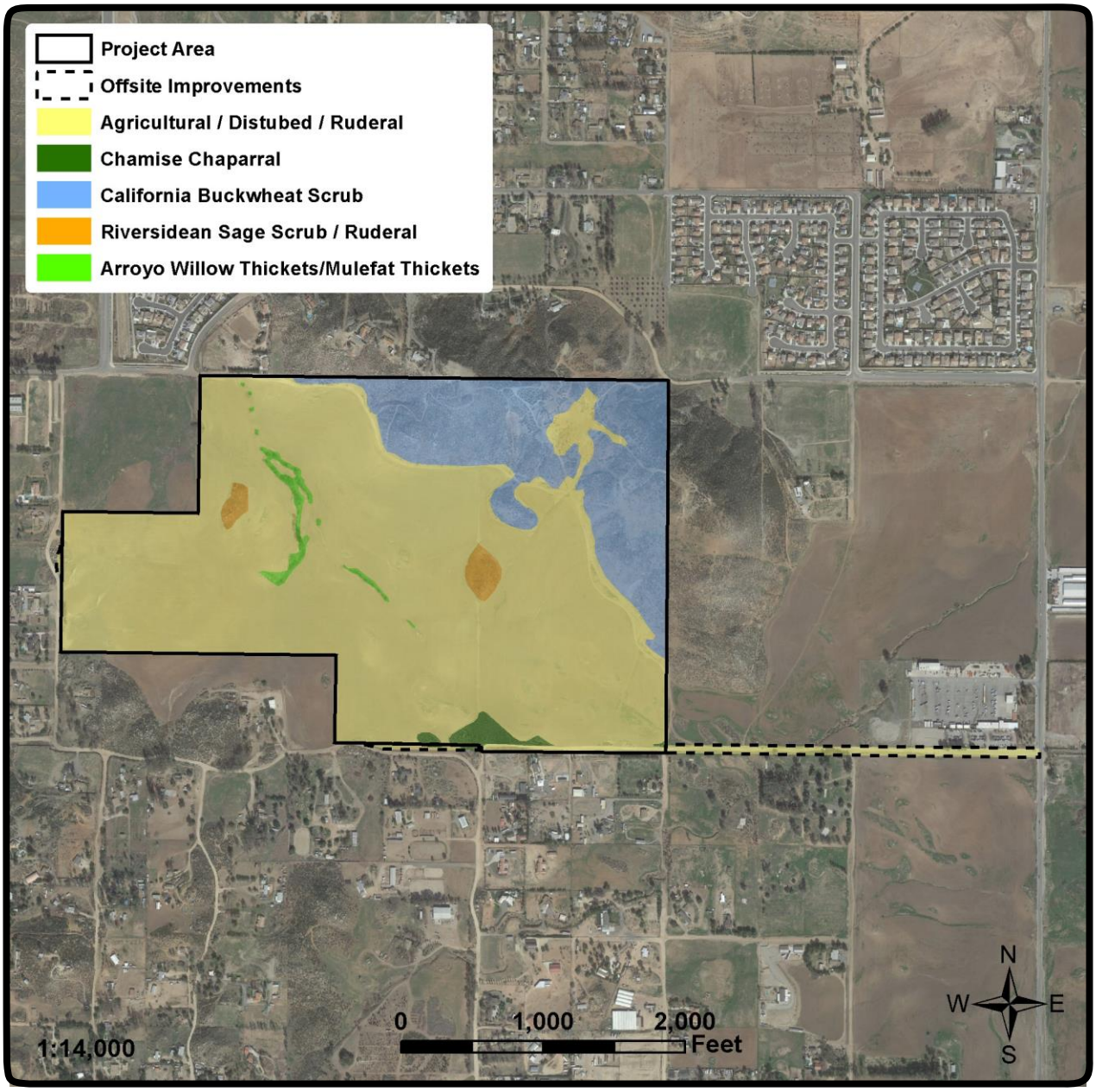

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Figure 7

Vegetation Community Map
(Photo obtained from Google Earth, February 2016)

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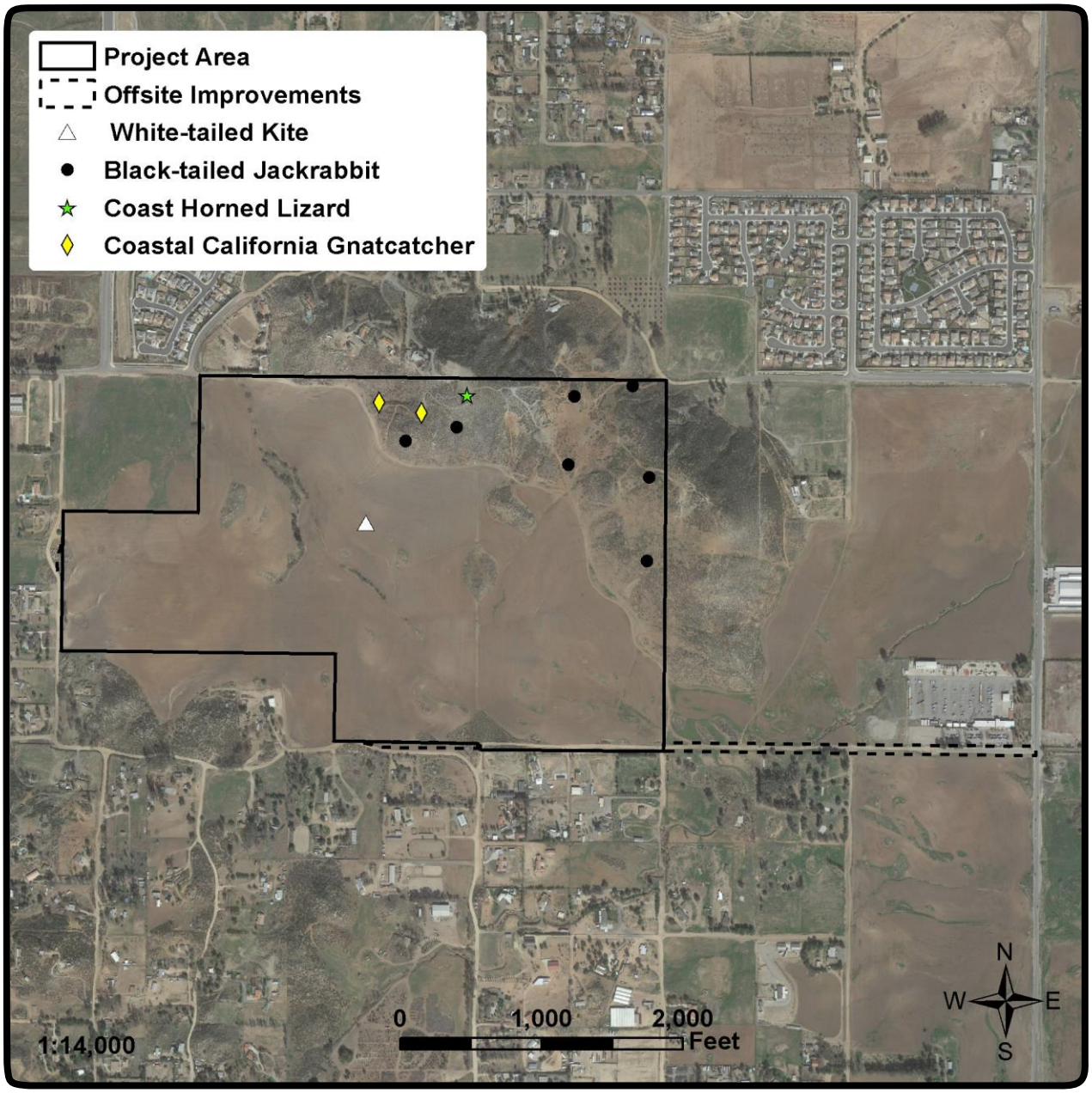

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Figure 8

Special Status Species – 2011
(Photo obtained from Google Earth, February 2016)

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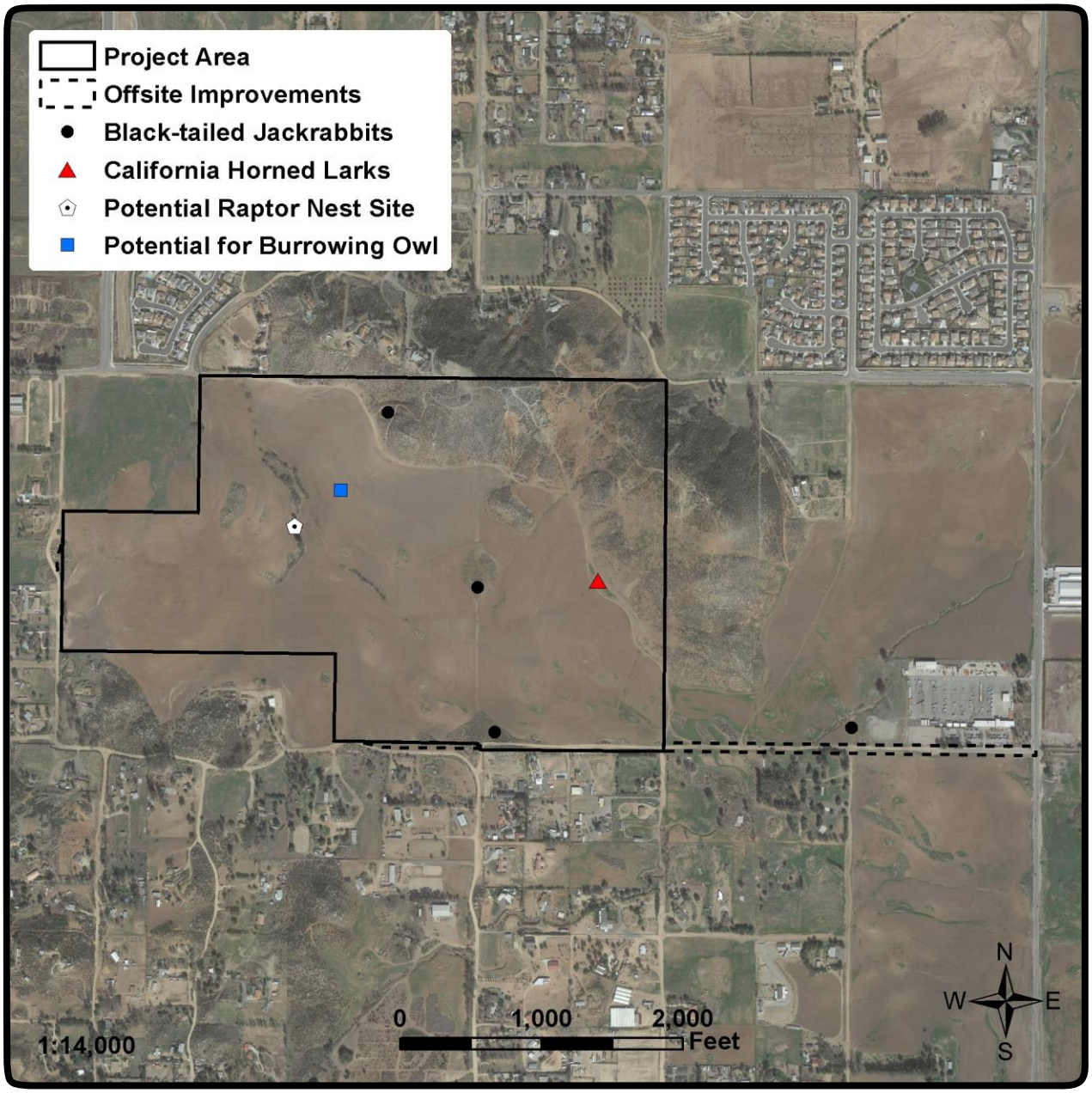

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Figure 9

Special Status Species – 2013
(Photo obtained from Google Earth, February 2016)

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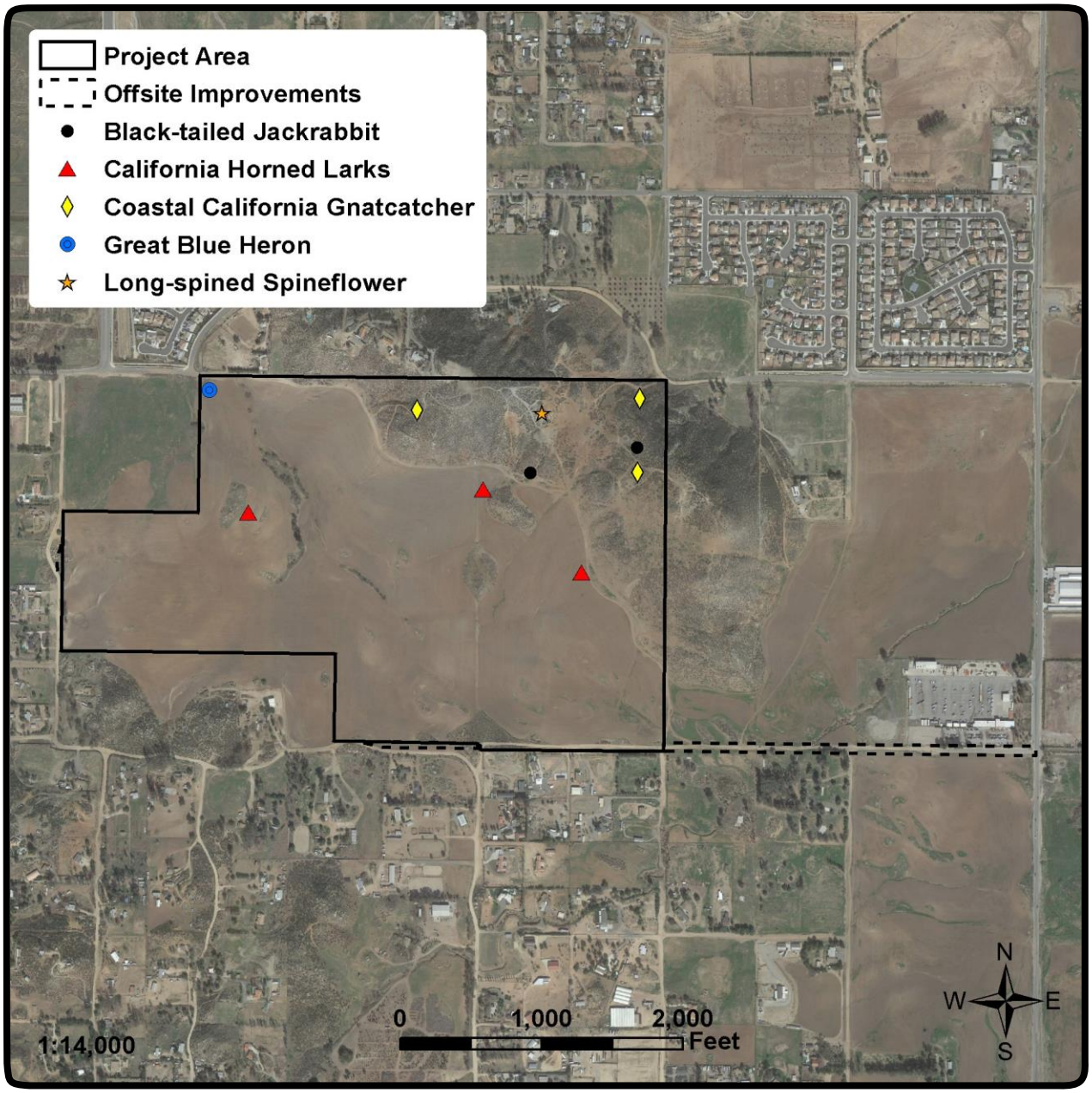

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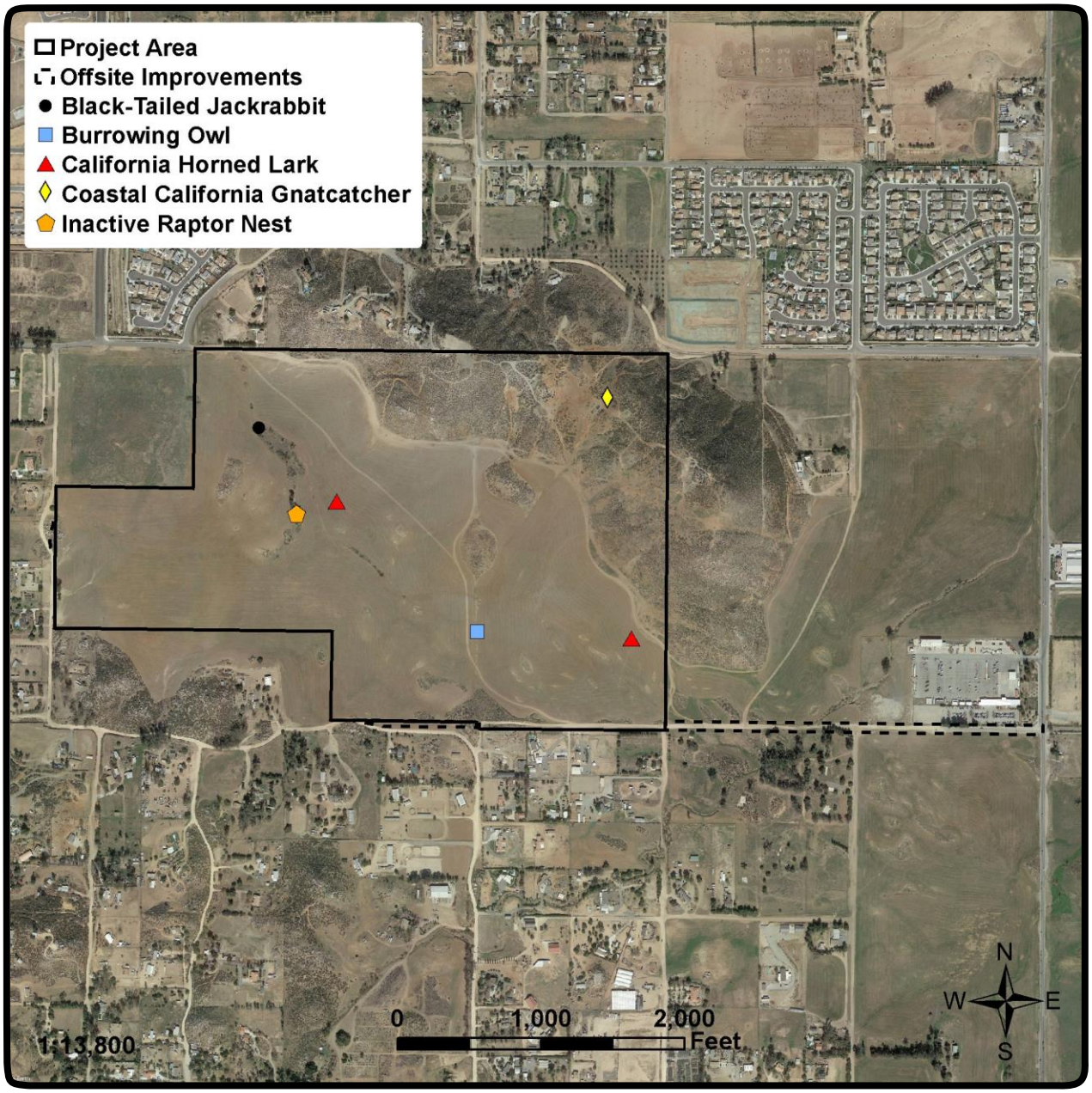
Figure 10

Special Status Species – 2017
(Photo obtained from Google Earth, February 2016)

Golden Meadows, TT 31194
City of Menifee, California



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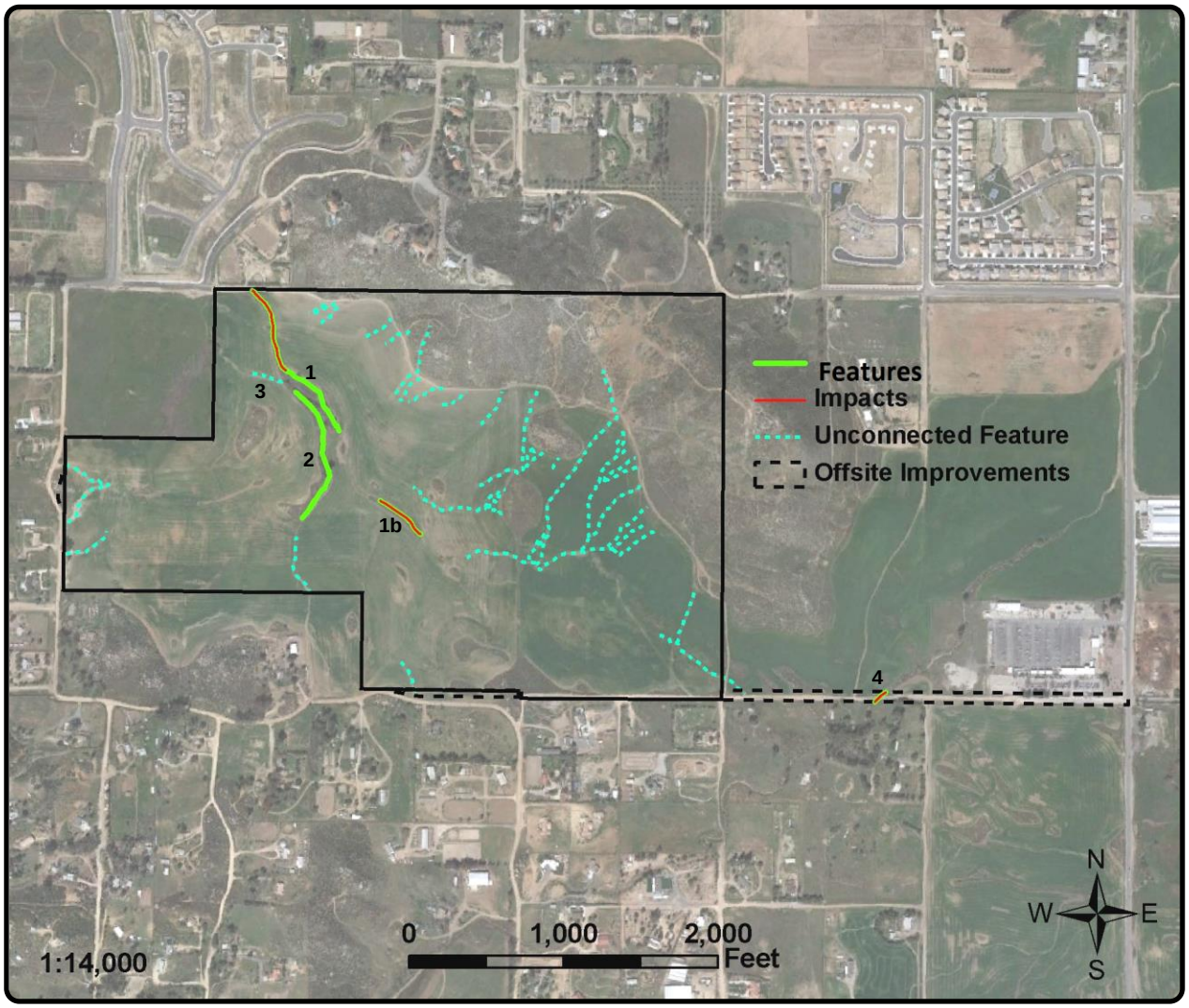
BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
October 2018

Figure 11

Sensitive Species – 2018
(Photo obtained from Google Earth, February 2018)

Golden Meadows, TT 31194
City of Menifee, California



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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
October 2018

Figure 12

Jurisdictional Areas (2018)
(Photo obtained from Google Earth, 3-9-2011)

Golden Meadows, TT 31194
City of Menifee, California

5.0) IMPACTS AND RECOMMENDATIONS

The purpose of this study was to identify biological resources on the project site, specifically burrowing owl and raptor nesting, white-tailed kite in particular.

The impacts and recommendations identified are based on the literature review, knowledge of species and habitats in the site vicinity, and the biological field survey. The information in this section is intended to serve as a planning tool for making decisions about future development of the project site.

One (1) burrowing owl and one (1) active burrow were identified onsite during the breeding season survey. Disturbance of occupied burrows must be avoided during the breeding season. CDFW recommends a buffer of 1,640 feet (500 meters) between a nesting site and high levels of disturbance (such as grading). Continued farming is recommended to discourage burrowing owls. If three (3) or more pairs of burrowing owl are found to be utilizing the site and there are greater than 35 acres of suitable habitat that is non-contiguous with MSHCP Conservation Area lands, the MSHCP requires conservation of at least 90 percent of the area with long-term conservation value and burrowing owl pairs.

Burrowing owls may be relocated outside of the nesting season. A winter burrowing owl survey is recommended to determine if the owl is a resident. Preparation of a Burrowing Owl Exclusion Plan is recommended to address relocation of the owl(s) on the project site. A preconstruction clearance survey (valid for 30 days) will also be required.

Trees and other vegetation and habitat suitable for nesting birds are present within and around the site and a potential raptor nest site (unoccupied) is present onsite. Based upon presence of potential nesting habitat, a preconstruction clearance survey for nesting birds (raptors in particular) is recommended prior to any site disturbance during the nesting season (generally February 1 through August 31). If nesting birds are present, avoidance of nests will be required and a buffer of at least 500 feet is recommended until juvenile birds have fledged and/or an authorized biologist has verified that the nest has become inactive.

Previous surveys identified one (1) special status plant species, long-spined spineflower. Under the MSHCP, this species is considered to be Adequately Conserved. Special status wildlife species observed during surveys include coastal California gnatcatcher, California horned lark, San Diego black-tailed jackrabbit, great blue heron, coast horned lizard, Cooper's hawk, white-tailed kite, northern harrier, and Costa's hummingbird. All of these species are considered

Adequately Conserved under the MSHCP except Costa's hummingbird, which is not covered under the MSHCP.

Soil types are not consistent with an alkali playa or vernal pool complex and pools or depressions characteristic of vernal pool habitat were not identified onsite. No MSHCP species listed for protection associated with riparian/riverine areas and vernal pools were observed. No fairy shrimp or potential fairy shrimp habitat was observed during this study.

Jurisdictional areas were identified onsite and have been reported previously. Regulatory permits from the USACE, CDFW, and RWQCB will be required for impacts to jurisdictional areas.

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APPENDIX A: Plant and Wildlife Species

Table 2. Plant and wildlife species. Plant and wildlife species identified on the Golden Meadows site during surveys from 2003 to 2018. One asterisk (*) indicates a non-native species; two asterisks (**) indicates a special status species; a question mark (?) indicates uncertainty regarding identification or native status. Wildlife species list excludes invertebrates.

Plants [N=115]

	Scientific Name	Common Name
	VASCULAR PLANTS	
	Dicotyledons	
	ADOXACEAE	**MUSKROOT FAMILY**
	Sambucus nigra ssp. *cerulea* (*S. mexicana*)	Mexican elderberry, blue elderberry
	AMARANTHACEAE	**AMARANTH FAMILY**
*	*Amaranthus albus*	Tumbleweed, tumbling pigweed
	ANACARDIACEAE	**SUMAC or CASHEW FAMILY**
*	*Schinus molle*	Peruvian pepper tree
	APIACEAE	**CELERY FAMILY**
	Daucus pusillus	Rattlesnake weed, wild carrot
	ASTERACEAE	**ASTER FAMILY**
	Acourtia microcephala (*Perezia microcephala*)	Scapellote, perezia
	Ambrosia acanthicarpa	Annual bur-sage, annual sandbur
*	*Anthemis cotula*	Mayweed, dog mayweed
	Artemisia californica	California sagebrush
	Baccharis salicifolia (*B. glutinosa*)	Mulefat
	Bebbia juncea	Sweetbush
*	*Centaurea melitensis*	Tocalote
	Chaenactis artemisiifolia	White pincushion, wormwood pincushion
	Corethrogyne filaginifolia var. *filaginifolia* (*Lessingia filaginifolia*)	California-aster, sand-aster
	Deinandra fasciculata (*Hemizonia fasciculata*)	Fascicled tarplant, slender tarweed
	Encelia farinosa	Brittlebush
	Erigeron canadensis (*Conyza canadensis*)	Horseweed, mare's tail
	Eriophyllum confertiflorum	Golden-yarrow
	Eriophyllum multicaule	Many-stem woolly daisy
	Gutierrezia californica (*G. bracteata*)	California matchweed

	Scientific Name	**Common Name**
	Helianthus annuus	Western sunflower
*	*Lactuca serriola*	Prickly lettuce
	Lasthenia californica (L. chrysostoma)	California goldfields
	Layia platyglossa	Tidy-tips
	Logfia filaginoides (Filago californica)	California filago
*	*Matricaria discoidea (Chamomilla suaveolens, M. matricarioides)*	Pineapple weed
	Rafinesquia californica	California chicory
*	*Senecio vulgaris*	Common groundsel
*	*Sonchus oleraceus*	Common sow thistle
	Stephanomeria virgata	Wreath plant
	Stylocline gnaphaloides	Everlasting neststraw
	Tetradymia comosa	Hairy horsebrush, common-thorn
	Uropappus lindleyi (Microseris lindleyi, M. linearifolia)	Silverpuffs
*?	*Xanthium spinosum*	Spiny cocklebur
	BORAGINACEAE	**BORAGE OR WATERLEAF FAMILY**
	Amsinckia intermedia (A. menziesii var. intermedia)	Large flower rancher's fiddleneck
	Cryptantha intermedia	Common cryptantha
	Heliotropium curassavicum	Wild heliotrope
	Pectocarya linearis	Slender pectocarya
	Phacelia minor	Wild Canterbury bells
	Phacelia ramosissima	Branching phacelia
	Plagiobothrys sp.	Popcornflower
	BRASSICACEAE	**MUSTARD FAMILY**
*	*Brassica nigra*	Black mustard
*	*Hirschfeldia incana (Brassica geniculata)*	Shortpod mustard
	Lepidium nitidum	Shining peppergrass
*	*Raphanus sativus*	Wild radish
*	*Sisymbrium irio*	London rocket
*	*Sisymbrium orientale*	Wild mustard, hare's ear cabbage
	Thysanocarpus curvipes	Lacepod
	CACTACEAE	**CACTUS FAMILY**
	Cylindropuntia californica var. *parkeri (Opuntia parryi)*	Valley cholla
	CHENOPODIACEAE	**GOOSEFOOT FAMILY**
*	*Chenopodium murale*	Nettle-leaved goosefoot, lamb's quarters
*	*Salsola tragus*	Russian thistle

	Scientific Name	Common Name
	CONVOLVULACEAE	**MORNING-GLORY FAMILY**
	Calystegia macrostegia	Morning-glory
	Cuscuta californica	Chaparral dodder, witch's hair
	CRASSULACEAE	**STONECROP FAMILY**
	Crassula connata (C. erecta)	Pygmy-weed, pygmy stonecrop
	CUCURBITACEAE	**GOURD FAMILY, CUCUMBER FAMILY**
	Cucurbita foetidissima	Calabazilla
	Marah macrocarpa	Chilicothe, wild cucumber
	EUPHORBIACEAE	**SPURGE FAMILY**
	Croton setiger (C. setigerus, Eremocarpus setiger, E. setigerus)	Turkey-mullein, doveweed
	Euphorbia albomarginata (Chamaesyce albomarginata)	Rattlesnake sandmat, rattlesnake weed
	FABACEAE	**LEGUME FAMILY, PEA FAMILY**
	Acmispon americanus (Lotus purshianus, L. unifoliatus)	"Spanish" clover
	Acmispon glaber (Lotus scoparius)	Deerweed
	Lupinus sp.	Unid. lupine
	Lupinus bicolor	Miniature lupine, dove lupine
*	*Medicago polymorpha*	California burclover
*	*Vicia villosa*	Winter vetch
	GERANIACEAE	**GERANIUM FAMILY**
*	*Erodium botrys*	Long-beak filaree
*	*Erodium cicutarium*	Redstem filaree
	LAMIACEAE	**MINT FAMILY**
*	*Marrubium vulgare*	Horehound
	Salvia apiana	White sage
	Salvia columbariae	Chia
	Salvia mellifera	Black sage
	Trichostema lanceolatum	Vinegar weed
	MALVACEAE	**MALLOW FAMILY**
*	*Malva parviflora*	Cheeseweed
	MYRSINACEAE	**MYRSINE FAMILY**
*	*Anagallis arvensis*	Scarlet pimpernel

	Scientific Name	Common Name
	MYRTACEAE	**MYRTLE FAMILY, EUCALYPTUS FAMILY**
*	*Eucalyptus* sp.	Ornamental eucalyptus
	NYCTAGINACEAE	**FOUR O'CLOCK FAMILY**
	Mirabilis laevis var. *crassifolia (M. californica)*	Wishbone bush
	ONAGRACEAE	**EVENING-PRIMROSE FAMILY**
	Camissonia sp.	Unid. evening-primrose
	Eulobus californica (Camissonia californica)	California false mustard, mustard evening primrose
	PAPAVERACEAE	**POPPY FAMILY**
	Eschscholzia californica	California poppy
	PHRYMACEAE	**LOPSEED FAMILY**
	Mimulus aurantiacus (M. puniceus, M. longiflorus)	Bush monkeyflower,sticky monkeyflower
	Mimulus guttatus	Seep monkeyflower
	PLANTAGINACEAE	**PLANTAIN FAMILY**
	Antirrhinum nuttallianum	Nuttall snapdragon, violet snapdragon
	Keckiella antirrhinoides	Yellow bush-penstemon
	Plantago erecta	California plantain
	POLEMONIACEAE	**PHLOX FAMILY**
	Eriastrum sapphirinum	Sapphire woollystar
	Navarretia hamata	Hooked navarretia
	POLYGONACEAE	**BUCKWHEAT FAMILY**
	Chorizanthe fimbriata	Fringed spineflower
**	*Chorizanthe polygonoides* var. *longispina*	Long-spined spineflower
	Eriogonum fasciculatum var. *foliolosum*	Leafy California wild buckwheat, interior California buckwheat
	Eriogonum fasciculatum var. *polifolium*	Mojave Desert California buckwheat
*	*Polygonum aviculare ssp. depressum (P. arenastrum)*	Common knotweed
*	*Rumex crispus*	Curly dock
	ROSACEAE	**ROSE FAMILY**
	Adenostoma fasciculatum	Chamise
	RUBIACEAE	**MADDER FAMILY, COFFEE FAMILY**
*?	*Galium aparine*	Goose grass, annual bedstraw

Scientific Name	Common Name
SALICACEAE	**WILLOW FAMILY**
Populus fremontii ssp. *fremontii*	Fremont cottonwood
Salix lasiolepis	Arroyo willow
SCROPHULARIACEAE	**FIGWORT FAMILY, SNAPDRAGON FAMILY**
Scrophularia californica	California figwort, coast figwort
SOLANACEAE	**NIGHTSHADE FAMILY**
Datura wrightii (D. meteloides)	Jimsonweed, tolguacha
* *Nicotiana glauca*	Tree tobacco
Solanum americanum	
*? *(S. nodiflorum)*	White nightshade
TAMARICACEAE	**TAMARISK FAMILY**
* *Tamarix species*	Tamarisk
URTICACEAE	**NETTLE FAMILY**
* *Urtica urens*	Dwarf nettle
ZYGOPHYLLACEAE	**CALTROP FAMILY**
* *Tribulus terrestris*	Puncture vine
Monocotyledons	
AGAVACEAE	**CENTURY PLANT FAMILY, AGAVE FAMILY**
Hesperoyucca whipplei (Yucca whipplei)	Chaparral yucca
LILIACEAE	**LILY FAMILY**
Calochortus splendens	Splendid mariposa lily
POACEAE	**GRASS FAMILY**
* *Avena barbata*	Slender wild oat
* *Avena fatua*	Wild oat
* *Bromus species*	Non-native brome
* *Bromus diandrus (B. rigidus)*	Ripgut brome
* *Bromus madritensis* ssp. *rubens (B. rubens)*	Red brome
* *Hordeum murinum*	Wall barley, hare barley
* *Lamarckia aurea*	Goldentop grass
* *Phalaris species*	Unid. canary grass
* *Schismus barbatus*	Mediterranean schismus
* *Triticum aestivum*	Common wheat (cultivated)

Scientific Name	**Common Name**
THEMIDACEAE	**BRODIAEA FAMILY**
Dichelostemma capitatum (D. pulchella, Brodiaea pulchella)	Blue dicks, wild hyacinth
Muilla maratima	Common muilla

* non-native species ** special status species

Wildlife [N=57]

	Scientific Name	**Common Name**
	VERTEBRATES	
	Reptiles	
	Iguanidae	Iguanid Lizards
	Sceloporus orcutti	Granite spiny lizard
	Uta stansburiana	Side-blotched lizard
	Phrynosomatidae	Spiny Lizards
**	*Phrynosoma blainvillii*	Coast horned lizard
	Teiidae	Whiptails and Relatives
**	*Aspidoscelis hyperythra*	Orange-throated whiptail
**	*Aspidoscelis tigris stejnegeri*	Coastal (western) whiptail
	Birds	
	Accipitridae	Hawks, Eagles, and Harriers
**	*Accipiter cooperii*	Cooper's hawk
	Buteo jamaicensis	Red-tailed hawk
**	*Circus cyaneus*	Northern harrier
**	*Elanus leucurus*	White-tailed kite
	Aegithalidae	Long-tailed Tits
	Psaltriparus minimus	Bushtit
	Alaudidae	Larks
**	*Eremophila alpestris actia*	California horned lark
	Apodidae	Swifts
	Aeronautes saxatalis	White-throated swift
	Ardeidae	Herons
**	*Ardea herodias*	Great blue heron (fly over)
	Cathartidae	Vultures
	Cathartes aura	Turkey vulture
	Charadriidae	Plovers
	Charadrius vociferus	Killdeer
	Columbidae	Pigeons and Doves
*	*Columba livia*	Rock dove, common pigeon
	Zenaida macroura	Mourning dove
	Corvidae	Crows and Jays
	Aphelocoma californica	California scrub jay
	Corvus brachyrhynchos	American crow

	Scientific Name	**Common Name**
	Corvus corax	Common raven
Cuculidae		Cuckoos
	Geococcyx californianus	Greater roadrunner
Emberizidae		Emberizine Sparrows
	Amphispiza belli	Sage sparrow
	Melospiza melodia	Song sparrow
	Pipilo crissalis senicula	California towhee
	Zonotrichia leucophrys	White-crowned sparrow
Falconidae		Falcons
	Falco sparverius	American kestrel
Fringillidae		Finches
	Carduelis psaltria	Lesser goldfinch
	Haemorhous (Carpodacus) mexicanus	House finch
Hirundinidae		Swallows
	Petrochelidon pyrrhonota tachina	Cliff swallow
	Stelgidopteryx serripennis	Northern rough-winged swallow
Icteridae		Icterids
	Agelaius phoeniceus	Red-winged blackbird
	Euphagus cyanocephalus	Brewer's blackbird
	Icterus bullockii	Bullock's oriole
	Sturnella neglecta	Western meadowlark
Mimidae		Mockingbirds
	Mimus polyglottos polyglottos	Northern mockingbird
	Toxostoma redivivum	California thrasher
Odontophoridae		Quail
	Callipepla californica californica	California quail
Parulidae		Wood Warblers
	Dendroica coronata	Yellow-rumped warbler
Picidae		Woodpeckers
	Colaptes auratus	Northern flicker
	Picoides nuttallii	Nuttall's woodpecker
Polioptilidae		Gnatcatchers
	Polioptila caerulea	Blue-gray gnatcatcher
**	*Polioptila californica californica*	Coastal California gnatcatcher
Strigidae		Owls
**	*Athene cunicularia*	Burrowing owl
Sturnidae		Starlings

	Scientific Name	**Common Name**
*	*Sturnus vulgaris*	European starling
	Timaliidae	Babblers
	Chamaea fasciata	Wrentit
	Trochilidae	Hummingbirds
	Calypte anna	Anna's hummingbird
**	*Calypte costae*	Costa's hummingbird
	Troglodytidae	Wrens
	Catherpes mexicanus	Canyon wren
	Thryomanes bewickii	Bewick's wren
	Turdidae	Thrushes
	Sialia mexicana	Western bluebird
	Tyrannidae	Tyrant Flycatchers
	Sayornis nigricans	Black phoebe
	Sayornis saya	Say's phoebe
	Tyrannus verticalis	Western kingbird
	Mammals	
	Canidae	Dogs, Foxes, and Coyotes
	Canis domesticus	Domestic dog
	Canis latrans	Coyote
	Geomyidae	Pocket Gophers
	Thomomys bottae	Botta's pocket gopher (sign)
	Leporidae	Rabbits
**	*Lepus californicus*	Black-tailed jackrabbit
	Sylvilagus audubonii	Audubon's cottontail
	Sciuridae	Squirrels
	Spermophilus beecheyi	California ground squirrel

Table 3. Details of special status species observations.

Species	Number	Date	Location Onsite	GPS Coordinates (WGS 1984)	Elevation (feet)
BUOW	1	05.30.18	SE	N 33.650610, E -117.188668	1536
CAGN	2 (pair)	05.24.18	NE	N 33.655112, E -117.185740	1576
BTJA	1	06.14.18	NW	N 33.654478, E -117.193719	1512
HOLA	S	05.24.18	Central	N 33.650510, E -117.185130	1548
HOLA	S	06.14.18	W central	N 33.653079, E -117.191911	1520
CHPO	2	05.12.17	NE corner	N 33.655304, E -117.187238	~1600
CAGN*	2 (pair)	03.28.17	NE corner	N 33.655604, E -117.184969	1576
CAGN	1 (male)	03.28.17	NE corner	N 33.654170, E -117.185007	1656
CAGN	1 (male)	04.01.17	N central	N 33.655336, E -117.190141	1621
BTJA**	2	03.28.17	NE corner	N 33.654645, E -117.185019	1650
BTJA	2	04.01.17	N central	N 33.654137, E -117.187498	1583
GBHE	1	04.01.17	NW corner	N 33.655683, E -117.194971	fly over
HOLA	S	04.01.17	E central	N 33.652212, E -117.186278	1560
HOLA	S	04.08.17	W central	N 33.653324, E -117.194038	1519
HOLA	S	04.25.17	N central	N 33.653816, E -117.188586	1556
HOLA	20+	09.17.13	E central	N 33.65190, E -117.17614	1561
BTJA	1	---.---.13	N central	N 33.655294, E -117.1908176	1563
BTJA	1	---.---.13	Central	N 33.651907, E -117.188694	1545
BTJA	1	---.---.13	S central	N 33.649095, E -117.188265	1570
BTJA	1	---.---.13	E offsite	N 33.649251, E -117.179982	1513
BTJA	1	04.26.11	S central	N 33.64902, E -117.18801	1579
BTJA	1	04.26.11	Central	N 33.65179, E -117.18867	1546
BTJA	1	04.26.11	N central	N 33.65523, E -117.19081	1557
BTJA	7+	04.26.11	NW	Multiple locations, see Figure 8	-----
CAGN	2 (pair)	04.29.11	NW	N 33.65529, E -117.19003	1637
CAGN	1 (male)	04.26.11	NW	N 33.65548, E -117.19102	1557
CHL	1	04.26.11	NE	N 33.65564, E -117.18898	1723
WTKI	1	04.26.11	Central	N 33.653036, E -117.191520	fly over

BTJA=black-tailed jackrabbit, BUOW=burrowing owl, CAGN=coastal California gnatcatcher, CHL=coast horned lizard, CHPO=long-spined spineflower, GBHE=great blue heron, HOLA=California horned lark, WTKI=white-tailed kite.

S=several, no exact count. Observations may or may not represent the same individuals observed on a different survey date.

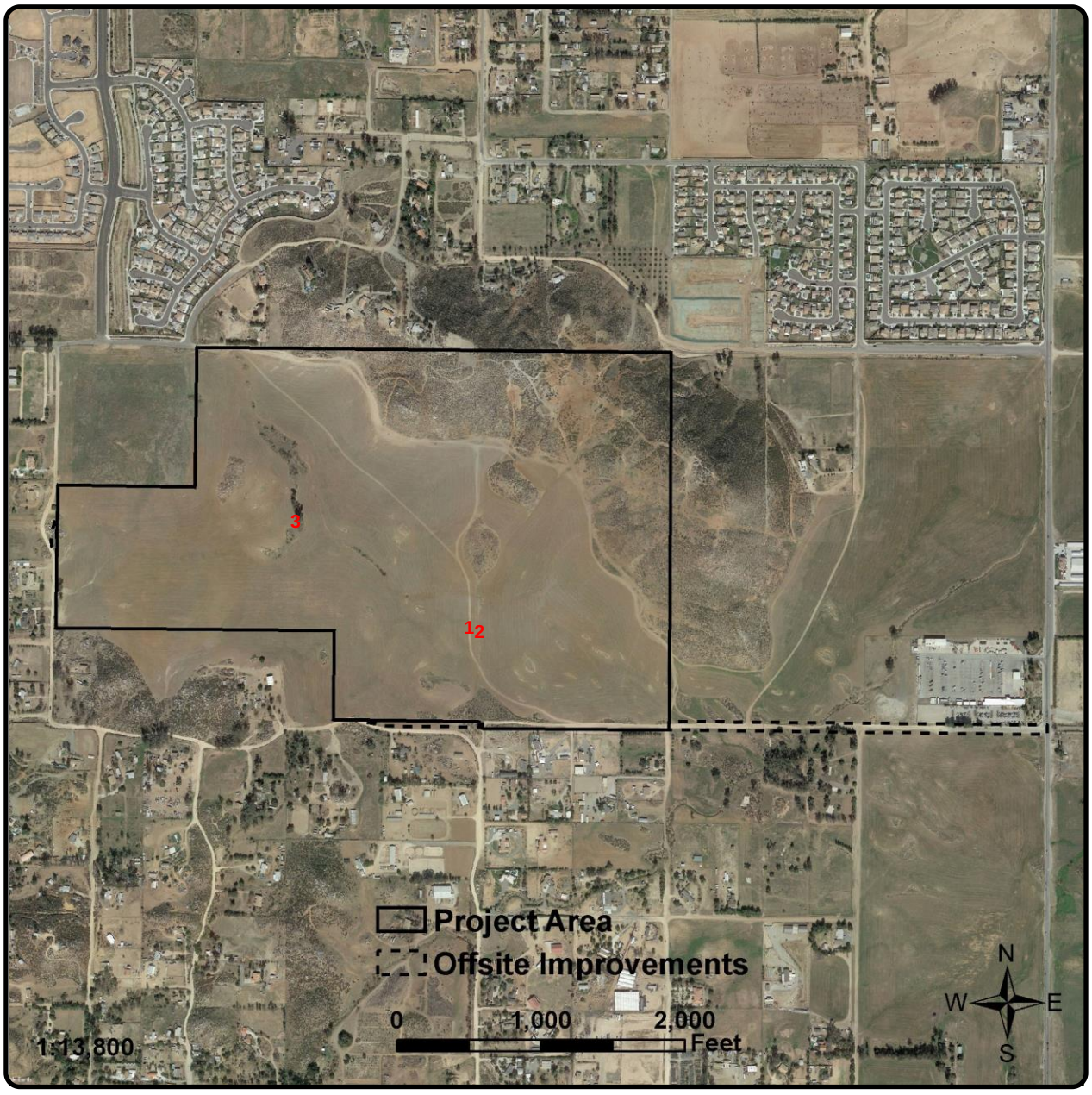
*CAGN was also detected in the same approximate areas on 04.08.17, 04.25.17, and 05.06.17. These are likely the same individuals previously detected in the area.

**BTJA was also detected in the same approximate areas on 04.08.17 and 05.06.17; number of individuals was not determined.

Other species observed during previous surveys are Cooper's hawk (2007), northern harrier (2011, 2013), and Costa's hummingbird (2011); details of these observations are not available.

Details of observations prior to 2011 are not available.

APPENDIX B: Site Photographs



(1) Burrowing owl observed on the site (May 30, 2018)

(2) Burrowing owl burrow site (June 14, 2018).

(3) Potential raptor nest in eucalyptus tree (June 14, 2018).

APPENDIX C: Riverside County Documentation

Certification

Certification: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: October 9, 2018 SIGNED: _____

Leslie Irish, Principal, L&L Environmental, Inc.
909-335-9897

1) Fieldwork Performed By:

Guy Bruyea
Name

2) Fieldwork Performed By:

_____
Name

3) Fieldwork Performed By:

_____
Name

4) Fieldwork Performed By:

_____
Name

5) Fieldwork Performed By:

_____
Name

6) Fieldwork Performed By:

_____
Name

Check here __ if adding any additional names / signatures below or on other side of page.

BIOLOGICAL REPORT SUMMARY SHEET

Applicant Name: Richland Communities
Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001
Section, Township and Range: Sections 15 and 16, Township 6 South, Range 3 West
Building and Safety Log Number: _____
Case Number: TR 31194 Lot/Parcel _____ EA Number _____

MARK ITEM(S) SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE of CONCERN	*(Mark Yes, No, or N/A regarding species findings on the referenced site)*		
		Yes	**No**	**n/a**
	Arroyo Southwestern Toad	Yes	No	n/a
X	Blue-line Stream(s) (previous survey)	Yes	No	n/a
X	Burrowing Owl	Yes	No	n/a
	Coachella Valley Fringed-toed Lizard	Yes	No	n/a
X	Coastal California Gnatcatcher	Yes	No	n/a
X	Coastal Sage Scrub (previous survey)	Yes	No	n/a
	Delhi Sands Flower-loving Fly	Yes	No	n/a
	Desert Pupfish	Yes	No	n/a
	Desert Slender Salamander	Yes	No	n/a
	Desert Tortoise	Yes	No	n/a
	Flat-tailed Horned Lizard	Yes	No	n/a
	Least Bell's Vireo	Yes	No	n/a
X	Oak Woodlands (previous survey)	Yes	No	n/a
X	Quino Checkerspot Butterfly (previous survey)	Yes	No	n/a
	Riverside Fairy Shrimp	Yes	No	n/a
	Santa Ana River Woolystar	Yes	No	n/a
	San Bernardino Kangaroo Rat	Yes	No	n/a
	Slender-horned Spineflower	Yes	No	n/a
	Stephens' Kangaroo Rat	Yes	No	n/a
X	Vernal Pools (previous survey)	Yes	No	n/a
X	Wetlands (previous survey)	Yes	No	n/a

MARK ITEM(S) SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE of CONCERN	*(Mark Yes, No, or N/A regarding species findings on the referenced site)*		
X	Cooper's Hawk (previous surveys)	Yes	No	n/a
X	California Horned Lark	Yes	No	n/a
X	Black-tailed Jackrabbit	Yes	No	n/a
X	White-tailed Kite (previous surveys)	Yes	No	n/a
X	Coast Horned Lizard (previous surveys)	Yes	No	n/a
X	Long-spined spineflower (previous survey)	Yes	No	n/a
X	Great blue heron (previous survey)	Yes	No	n/a
X	Northern harrier (previous survey)	Yes	No	n/a
X	Costa's hummingbird (previous survey)	Yes	No	n/a
	Other	Yes	No	n/a

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened, or candidate species by either state, or federal regulations, or for Riverside County as listed by the California Department of Fish and Wildlife Natural Diversity Data Base (CNDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report or habitat assessment.

L & L Environmental, Inc. — October 9, 2018

Signature and Company Name — Date

10(a) Permit Number (if applicable) — Permit Expiration Date

County Use Only

Received By: _____ Date: _____

PD-B# _____

Attachment E-4

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit two copies to the County)

Case Number: TR 31194 Lot/Parcel No. _____ EA Number _____

Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001

Date: October 9, 2018

Biological Resources: (Check the level of impact that applies to the following questions.)

Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?

☐ ■ ☐ ☐

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?

☐ ■ ☐ ☐

c) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, or U. S. Wildlife Service?

☐ ■ ☐ ☐

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

☐ ■ ☐ ☐

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit two copies to the County)

e) Have a substantial adverse effect on any riparian habitat, or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife, or the U.S. Fish and Wildlife Service?

☐ ■ ☐ ☐

f) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption)

☐ ■ ☐ ☐

g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

☐ ■ ☐ ☐

Findings of Fact:

A mapped blue-line stream is present onsite and is associated with riparian/riverine vegetation.

One (1) special status plant species and nine (9) special status wildlife species have been identified onsite during past and present surveys (long-spined spineflower, coastal California gnatcatcher, Cooper's hawk, white-tailed kite, California horned lark, great blue heron, northern harrier, Costa's hummingbird, black-tailed jackrabbit, and coast horned lizard).

Potential nesting habitat for burrowing owl and other bird species is present onsite. One (1) burrowing owl was identified onsite along with one (1) active burrow. One (1) inactive potential raptor nest is present onsite. There is no evidence of nesting by white-tailed kite.

Proposed Mitigation:

Avoidance and/or onsite or offsite restoration of riparian habitat is recommended. Preconstruction surveys for burrowing owl and other nesting bird species are recommended prior to disturbance of the site.

A winter focused survey for burrowing owl is recommended as well as preparation of a Burrowing Owl Exclusion Plan if the owl is a resident.

Monitoring Recommended:

None.

Source: CGP Fig. VI.36-VI.40
Revised October 1999

APPENDIX D: CNDDB Forms

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 06/14/2018

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Lepus californicus bennettii*

Common Name: black-tailed jackrabbit

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: 1 Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ No ☐ Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Guy Bruyea / L&L Environmental
Address: 700 East Redlands Blvd #U351
Redlands, CA 92373
E-mail Address: cwakeman@llenviroinc.com
Phone: 909.335.9897

Plant Information
Phenology: _____ % vegetative _____ % flowering _____ % fruiting

Animal Information
1 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Riverside Landowner / Mgr: Private
Quad Name: Romoland Elevation: 1512
T 6S R 3W Sec 15, ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec___, ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: _____
DATUM: NAD27 ( ) NAD83 ( ) WGS84 ( ) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)
Coordinates: 33.654478 -117.193719

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent ( ) Good (●) Fair ( ) Poor
Immediate AND surrounding land use: Agriculture, residential
Visible disturbances: Agricultural activities
Threats: Proposed development
Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☒ Other: identified by experienced field biologist

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

CDFW/BDB/1747 Rev. 7/15/2015

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 05/30/2018

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Athene cunicularia*

Common Name: Burrowing owl

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: 1 Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ No ☐ Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Guy Bruyea / L&L Environmental
Address: 700 East Redlands Blvd #U351
Redlands, CA 92373
E-mail Address: cwakeman@llenviroinc.com
Phone: 909.335.9897

Plant Information
Phenology:
_____ % vegetative _____ % flowering _____ % fruiting

Animal Information
1 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☒ burrow site ☐ lek ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Riverside Landowner / Mgr: Private
Quad Name: Romoland Elevation: 1536
T 6S R 3W Sec 15 , ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec___ , ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: _____
DATUM: **NAD27** ( ) **NAD83** ( ) **WGS84** ( ) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)
Coordinates: 33.650610 -117.188668

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Fallow agricultural field
One owl observed and one occupied burrow, nesting not determined

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent ( ) Good (●) Fair ( ) Poor
Immediate AND surrounding land use: Agriculture, residential
Visible disturbances: Agricultural activities
Threats: Proposed development
Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☒ Other: identified by experienced field biologist

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

CDFW/BDB/1747 Rev. 7/15/2015

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 05/24/2018

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Polioptila californica californica*

Common Name: coastal California gnatcatcher

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: 2 Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? 736 Yes, Occ. # ☐ No ☐ Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Guy Bruyea / L&L Environmental
Address: 700 East Redlands Blvd #U351
Redlands, CA 92373
E-mail Address: cwakeman@llenviroinc.com
Phone: 909.335.9897

Plant Information
Phenology:
_____ % vegetative _____ % flowering _____ % fruiting

Animal Information
2 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Riverside Landowner / Mgr: Private
Quad Name: Romoland Elevation: 1576
T 6S R 3W Sec 15 , ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec___ , ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: _____
DATUM: **NAD27** ( ) **NAD83** ( ) **WGS84** ( ) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)
Coordinates: 33.655112 -117.185740

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent ( ) Good (●) Fair ( ) Poor
Immediate AND surrounding land use: Agriculture, residential
Visible disturbances: Agricultural activities
Threats: Proposed development
Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☒ Other: identified by experienced field biologist

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

CDFW/BDB/1747 Rev. 7/15/2015

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 05/24/2018

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Eremophila alpestris actia*

Common Name: California horned lark

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: several Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ No ☐ Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Guy Bruyea / L&L Environmental
Address: 700 East Redlands Blvd #U351
Redlands, CA 92373
E-mail Address: cwakeman@llenviroinc.com
Phone: 909.335.9897

Plant Information
Phenology: _____ % vegetative _____ % flowering _____ % fruiting

Animal Information
10 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Riverside Landowner / Mgr: Private
Quad Name: Romoland Elevation: 1548
T 6S R 3W Sec 15 , ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec___ , ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: _____
DATUM: NAD27 ( ) NAD83 ( ) WGS84 ( ) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) *OR* Geographic (Latitude & Longitude) (●)
Coordinates: 33.650510 -117.185130

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent ( ) Good (●) Fair ( ) Poor
Immediate AND surrounding land use: Agriculture, residential
Visible disturbances: Agricultural activities
Threats: Proposed development
Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☒ Other: identified by experienced field biologist

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

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Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@wildlife.ca.gov

Date of Field Work (mm/dd/yyyy): 06/14/2018

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Eremophila alpestris actia*

Common Name: California horned lark

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: several Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ No ☐ Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Guy Bruyea / L&L Environmental
Address: 700 East Redlands Blvd #U351
Redlands, CA 92373
E-mail Address: cwakeman@llenviroinc.com
Phone: 909.335.9897

Plant Information
Phenology:
_____ % vegetative _____ % flowering _____ % fruiting

Animal Information
10 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Riverside Landowner / Mgr: Private
Quad Name: Romoland Elevation: 1520
T 6S R 3W Sec 15 , ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec___ , ___ 1/4 of ___ 1/4, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: _____
DATUM: NAD27 ( ) NAD83 ( ) WGS84 ( ) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)
Coordinates: 33.653079 -117.191911

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent ( ) Good (●) Fair ( ) Poor
Immediate AND surrounding land use: Agriculture, residential
Visible disturbances: Agricultural activities
Threats: Proposed development
Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☒ Other: identified by experienced field biologist

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

CDFW/BDB/1747 Rev. 7/15/2015

L&L ENVIRONMENTAL, INC.
REGULATORY SERVICES
BIOLOGICAL & CULTURAL INVESTIGATIONS & MONITORING

FOCUSED BURROWING OWL SURVEY FOR TRACT 31194, GOLDEN MEADOWS, CITY OF MENIFEE, CALIFORNIA

±207 Acre Property, ±207 Acres Surveyed

APNs 360-300-002, -003, -004, -005, -006, -009, 360-350-001, and portions of offsite 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -024, 360-360-009, -010, -011, and 360-380-004, Tract 31194, Menifee Area, Sections 15 and 16, Township 6 South, Range 3 West, USGS Romoland, 7.5' Topographic Quadrangle

Prepared For:

Brian Hardy
Richland Communities
3161 Michelson Drive, Suite 425
Irvine, CA 92612
949-698-2191

Prepared By:

Leslie Irish, Principal — lirish@llenviroinc.com
Guy Bruyea, Field Biologist — gbruyea@llenviroinc.com
Carla Wakeman, Senior Biologist — cwakeman@llenviroinc.com
Jeffrey Sonnentag, Technical Editor — jsonnentag@llenviroinc.com

Report Summary:

No burrowing owls, owl sign, or active burrows were observed onsite in 2019. One (1) burrowing owl and one (1) potentially occupied burrow were observed in 2018. Tall, dense growth of non-native vegetation was present across the site in 2019, covering the burrow site and creating unsuitable conditions for burrowing owl. If future farming activities remove this vegetation, potentially suitable habitat may be present on the site again. A preconstruction burrowing owl survey is recommended. Habitat suitable for nesting birds (including raptors) is present within and around the site and a preconstruction nesting bird survey is recommended. Previous surveys identified one (1) listed species (coastal California gnatcatcher) and several special status species onsite, including white-tailed kite, northern harrier, coast horned lizard, coastal (western) whiptail, orange-throated whiptail, San Diego black-tailed jackrabbit, Cooper's hawk, California horned lark, great blue heron, Costa's hummingbird, and long-spined spineflower. There is no evidence of white-tailed kite nesting on the project site. Jurisdictional riparian/riverine areas were previously identified on the project site. Regulatory permits will be required for impacts to jurisdictional areas. No vernal pools or areas of potential habitat for fairy shrimp were observed or are present onsite.

Surveys Conducted By: Guy Bruyea

Surveys Conducted: April through June 2019

Report Date: July 2019

\\DARWIN\Shared Folders\Unified Projects\RLCC-03-187 Menifee Assemblage - Golden Meadows\2019 BO9\Report\RLCC-03-R187.BO9 (final).doc

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MANAGEMENT SUMMARY

L&L Environmental, Inc. (L&L) conducted breeding season burrowing owl surveys on Richland Communities' ±207-acre project (and associated offsite improvement areas) in the City of Menifee, California. The purpose of this work effort was to re-examine the subject property to determine presence/absence of burrowing owl.

L&L has performed studies on this property for over a decade (beginning in 2003) under a number of contractors and proponents. This study reflects the most current field conditions and, where pertinent, makes comparative statements as to past and historic conditions.

Land use varies within and adjacent to the survey area and includes anthropogenic disturbances such as rural residential areas, active and fallow agricultural areas, unimproved roads, powerline easements, off-road vehicle activity, debris piles, and windblown debris. Two (2) roads are present on the property. One (1) is located along the northern and eastern portion of the property where agricultural areas meet less disturbed sage scrub areas. This unimproved road begins at the eastern terminus of Daniel Road and exits at the southeastern corner of the site near the intersection of Evans Road and Ascot Way. Krubsack Road (unimproved) trends north to south through agricultural fields within the roughly west-central portion of the property and connects with Wickerd Road to the south and Daniel Road to the north.

The site consists of agricultural fields and a mix of disturbed to relatively undisturbed buckwheat scrub and chamise chaparral vegetation communities. The agricultural fields are dry farmed for wheat. The site has also been used for sheep grazing in the past, but no grazing was observed during the current survey.

A shallow drainage and mapped blue-line stream is present onsite (trending from south to north within the central portion of the site), as well as various other jurisdictional features. No vernal pools or areas of potential habitat for fairy shrimp were observed or are present onsite.

Based upon presence of relatively flat open areas with low-growing vegetation on large portions of the site, close proximity to a fresh water source, and recent records of burrowing owl in the vicinity, habitat suitable for use by burrowing owl was determined to be present on much of the subject property. There were no burrowing owl observations during biological surveys of the site in 2003, 2004, 2005, 2006, and 2011. L&L conducted focused late-season surveys on the site and surrounding buffer areas in August 2013 with negative results. However, one (1) location was noted that may have been used in the recent past, based upon presence of a

single feather found at an entrance to a hole beneath a grouping of medium-sized rocks. There was a rock immediately adjacent to the entrance that was evidently used for avian perching (species undetermined) based on the presence of droppings, but no other sign, including additional feathers, scat, prey bones, tracks, or other indicators were found at the location.

Focused surveys for burrowing owl were not conducted in 2017, but general surveys included searches for burrowing owl and active burrows. No burrowing owl, occupied burrows, or burrowing owl sign were observed. Surveys in 2018 observed one (1) burrowing owl and one (1) active burrow and potential nesting site. The owl was observed during the survey on May 30, but was not observed during subsequent surveys. No burrowing owl, owl sign, or active burrows were observed in 2019. Tall, dense growth of non-native vegetation was present in the agricultural fields in 2019, covering the burrow site and creating unsuitable conditions for burrowing owl. If future farming activities remove this vegetation, potentially suitable habitat may be present on the site again. A preconstruction clearance survey for burrowing owl (valid for 30 days) will be required.

A white-tailed kite was observed flying over the site during a survey in 2011 but has not been observed subsequently. The California Natural Diversity Database (CNDDB) has documented occurrences of five (5) white-tailed kite nests within 10 miles of the project site (CDFW 2018c). There are several large eucalyptus trees on and adjacent to the site that may be suitable for raptor nesting. There is a raptor nest onsite in a large eucalyptus tree and it may have been used by red-tailed hawk in the past, but it was not observed to be active in 2017, 2018, or 2019. No white-tailed kite nesting has been observed onsite.

Habitat suitable for nesting birds is present within and around the site and a preconstruction survey for nesting birds should be conducted prior to any site disturbance during the nesting season (generally February 1 through August 31). If nesting birds are present, avoidance of nest sites will be required and a buffer of 300 to 500 feet is recommended until juvenile birds have fledged and/or an authorized biologist has verified that the nest is no longer active.

Previous surveys identified one (1) federally listed species (coastal California gnatcatcher) and several special status species onsite, including white-tailed kite, northern harrier, coast horned lizard, San Diego black-tailed jackrabbit, Cooper's hawk, California horned lark, great blue heron, Costa's hummingbird, and long-spined spineflower. Coastal California gnatcatcher and California horned lark were detected on the site in 2019.

1.0) INTRODUCTION

The following report was prepared by L&L Environmental, Inc. (L&L) for Richland Communities. It describes the results of biological surveys conducted on a proposed development located on lands within the City of Menifee. The project site consists of APNs 360-300-002, -003, -004, -005, -006, -009, and 360-350-001 (totaling ±207 acres) and portions of offsite APNs 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -024, 360-360-009, -010, -011, and 360-380-004 where improvements are planned.

Our assessment consisted of (1) a records search and literature review, conducted to determine the species of concern in the project area and proximity to closest documented special status species observations, and (2) field reconnaissance to identify presence/absence of habitat and species of concern (particularly burrowing owl).

1.1) Location

The site is located in the Paloma Valley west of Interstate Highway 215 (I-215), south of Newport Road, and east of Murrieta Road (Figure 1). The site is located between Wickerd Road to the south and Garbani Road to the north. The project site is situated in Sections 15 and 16, Township 6 South, Range 3 West, within the USGS Romoland 7.5' series quadrangle map (Figure 2).

The site is generally bounded as follows: to the west by a mixture of actively cultivated and fallow agricultural areas, Evans Road (unimproved), and rural residential units; to the east by a mixture of disturbed and relatively undisturbed open space, Ascot Way (unimproved), and a Verizon Communications complex beyond; to the north by a mixture of disturbed and relatively undisturbed lands, rural residential areas, Garbani Road (unimproved), and a housing development beyond; and to the south by Wickerd Road (unimproved), rural residential areas, and a mix of disturbed and relatively undisturbed lands beyond (Figure 3).

In addition to surveys conducted on the main site, offsite improvement areas were included in these surveys. These included two (2) separate areas: 1) a 0.5 mile section of Wickerd Road between the southeast corner of the main site east to Haun Road and 2) an area south of the south-central portion of the main site boundary roughly located between the intersection of Wickerd Road and Bradley Road and west to approximately Krubsack Road.

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July 2019

Figure 1

Project Vicinity Map

Golden Meadows, TT 31194
City of Menifee, California

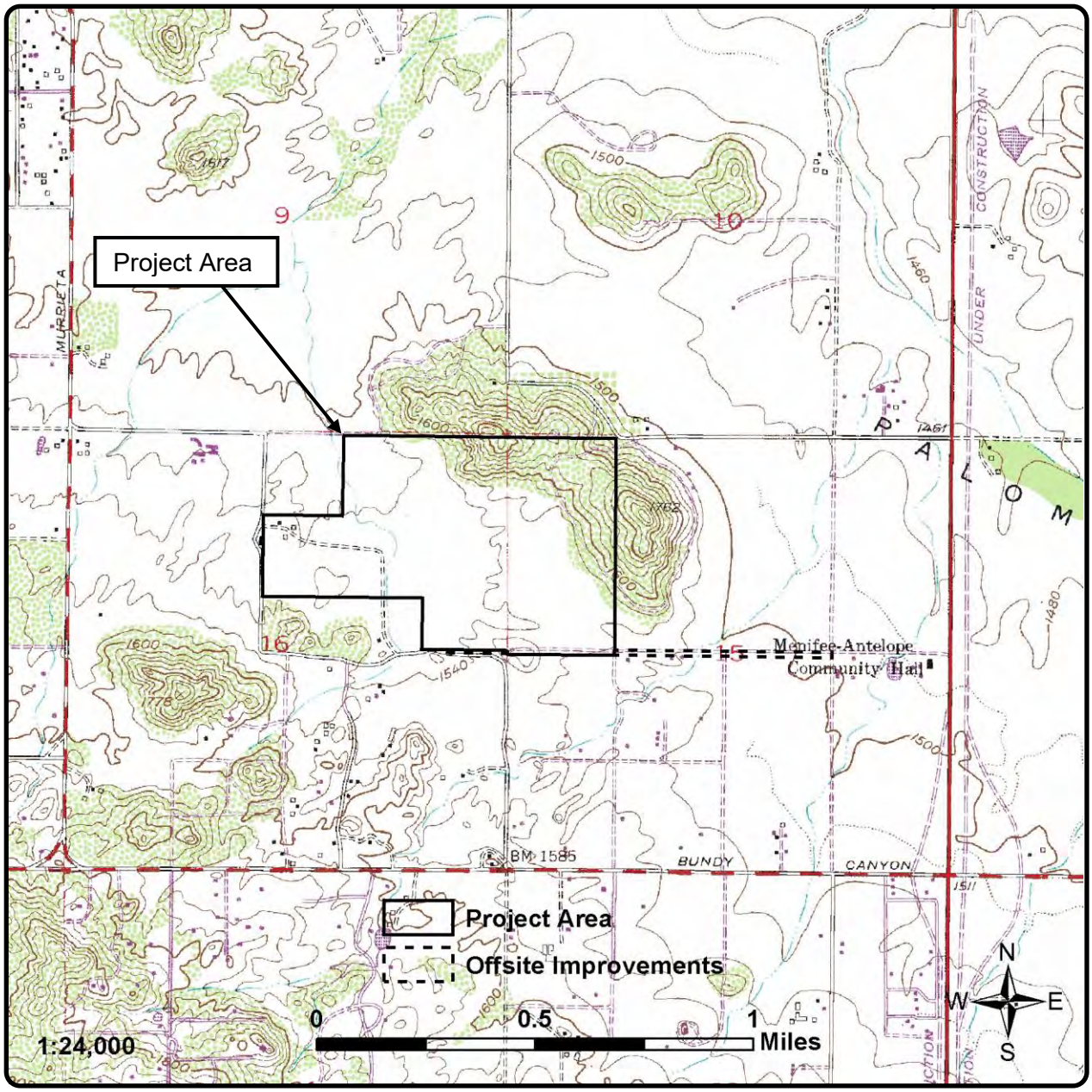

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Figure 2

Project Location Map
(USGS Romoland 1979 quadrangle,
Sections 15 & 16, Township 6 South, Range 3 West)

Golden Meadows, TT 31194
City of Menifee, California

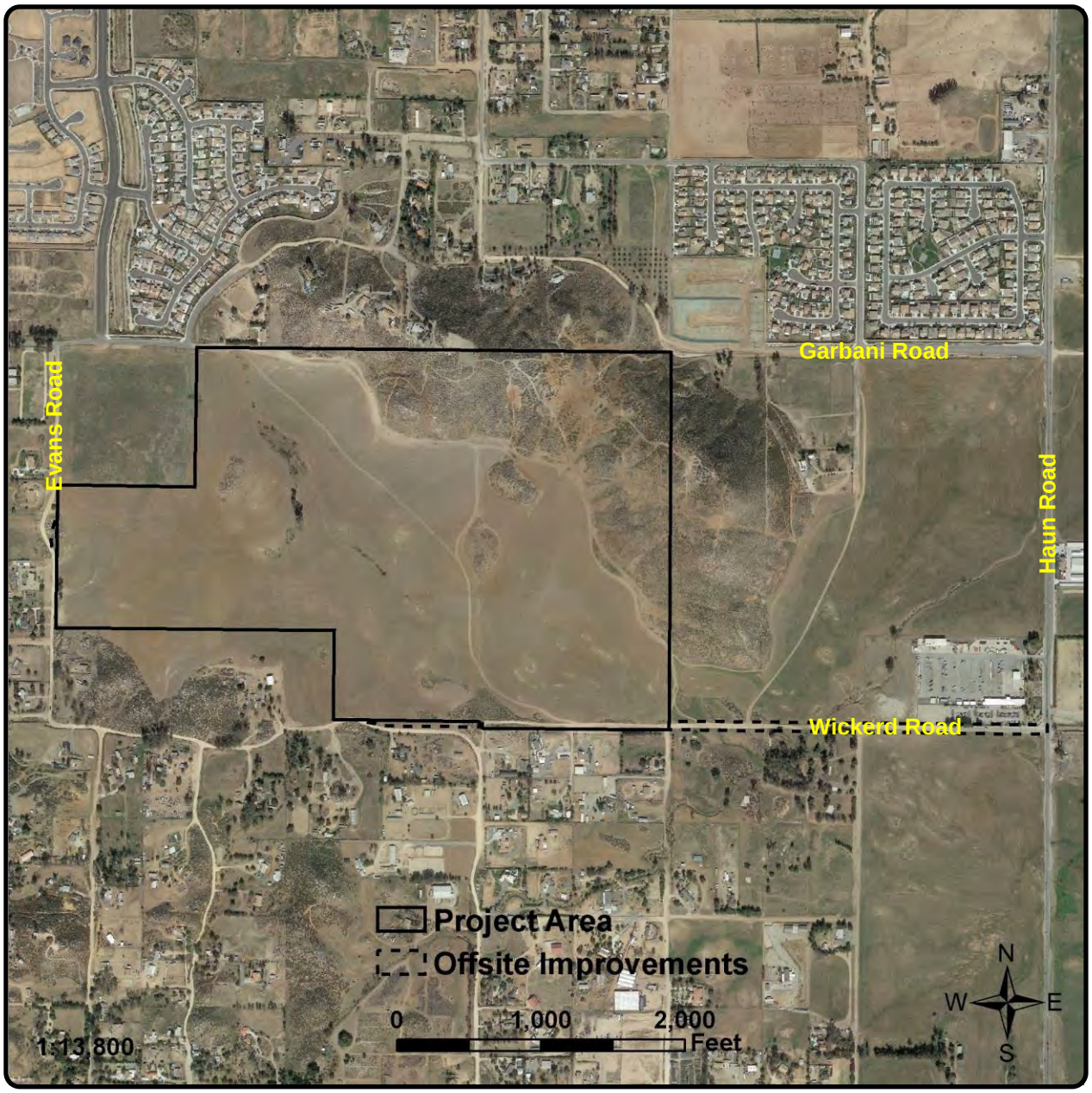

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Figure 3

Aerial Photograph
(Photo obtained from Google Earth, February 2018)

Golden Meadows, TT 31194
City of Menifee, California

1.2) Vegetation and Setting

Much of the subject property has been disturbed in association with previous dry-land farming and sheep grazing. As a result, these areas do not support native habitat communities. In the historically less disturbed areas of the property, remnants of California buckwheat scrub and chamise chaparral vegetation are present. Two (2) unimproved roads are present onsite.

A shallow drainage feature and mapped blue-line stream is present trending from the southwest/central to the northwest portion of the site. Much of this area has been impacted by agricultural activities and invasive plants, but several woody riparian species are present in association with this feature.

Land uses adjacent to the survey area include rural residential, agricultural, large animal husbandry, unimproved roads, powerline easements, off-road vehicle activity, storage, and debris piles. An unimproved road begins at the eastern terminus of Daniel Road and exits at the southeastern corner of the site near the Evans Road and Ascot Way intersection. Krubsack Road (unimproved) runs north-south through agricultural fields within the roughly west-central portion of the property and connects with Wickerd Road to the south and Daniel Road to the north.

The agricultural fields are dry farmed for wheat. During 2019, the fields were densely vegetated with non-native species including short-pod mustard (*Hirschfeldia incana*), wild radish (*Raphinus sativus*), and other non-native annuals. Some native species, such as large flower rancher's fiddleneck (*Amsinckia intermedia*), were also present. The site has also been used for sheep grazing in the past, but no grazing was observed during the present survey.

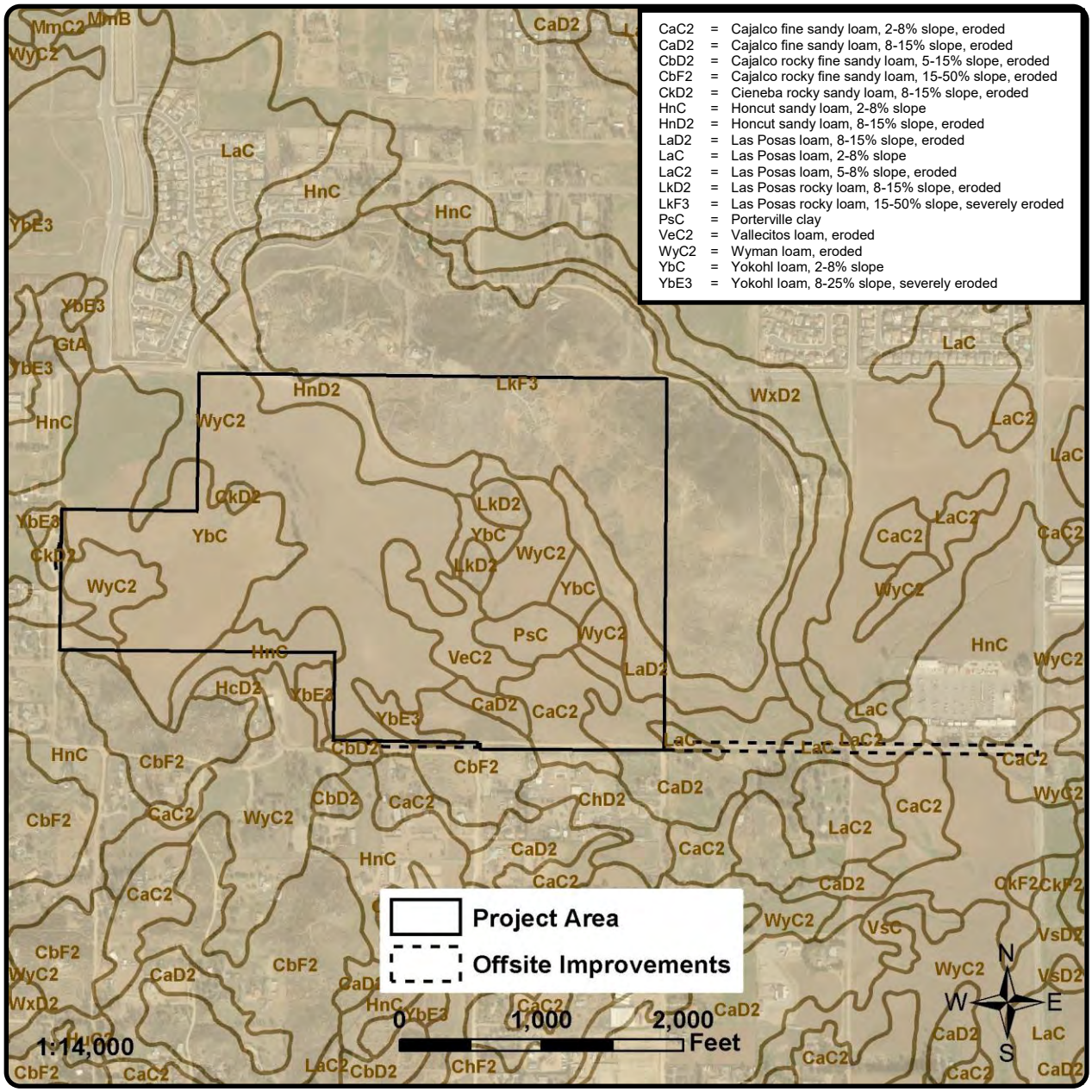
1.3) Soils and Topography

Soils on the project site were mapped by the Natural Resources Conservation Service (2018) as a mixture of several soil types, including Wyman loam (WyC2), Vallecitos loam (VeC2), Porterville clay (PsC), Yokohl loam (YbC and YbE3), Cajalco fine sandy loam (CaC2 and CaD2), Cajalco rocky fine sandy loam (CbF2), Honcut sandy loam (HnC and HnD2), Las Posas loam (LaD2), and Las Posas rocky loam (LkD2 and LkF3) (Figure 4). The most common soils mapped for the subject property are Wyman loam on the central and western portion of the site (in farmed areas) and Las Posas rocky loams on densely vegetated hillsides within the northern and eastern portions of the site. Clay soils are relatively uncommon on the site, but Porterville clay is present near the southeastern portion of the property within the agricultural areas. Soils

observed onsite range from mostly sandy-loamy within the farmed areas to rocky loamy on the less disturbed vegetated hillsides. Cryptobiotic crusts are present, but only within less disturbed portions of the site away from previously farmed areas.

Topographically, much of the site is primarily flat and contains open lands with low-relief rocky outcrops and shallow depressions. Gently to steeply sloping hills and ridgelines are present within the northeastern portion of the property. The site has a combined maximum vertical relief of roughly 220 feet between highest and lowest points on the property, with elevation ranging from approximately 1,500 to 1,720 feet above mean sea level (AMSL).

Surrounding topographic features in the project vicinity include gently to steeply sloping hills and ridgelines interspersed with lower-lying relatively flat areas. Although most surrounding areas of the Paloma Valley are primarily flat, significant topographic features are present northwest and southwest of the property at elevations of approximately 1,760 to 1,820 feet AMSL. Bell Mountain, a significant topographic feature located approximately two (2) miles east of the subject property, rises to 1,848 feet AMSL.



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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

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Figure 4

Soils Map

(Photo obtained from Google Earth, February 2016, USDA Nat. Res. Cons. Serv. SSURGO Data)

Golden Meadows, TT 31194
City of Menifee, California

2.0) REGULATORY ENVIRONMENT

2.1) Federal

2.1.1) Federal Endangered Species Act

By law, it is a requirement of the federal Endangered Species Act (FESA), 1973 (as amended) at Section 7(a)(2) that federal agencies ensure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat. In order to comply with this requirement, the federal agency must conduct a Biological Assessment (BA), in which effects to listed species are analyzed and disclosed in the form of an "effects determination."

Section 7 requires federal agencies to consult with the U. S. Fish and Wildlife Service (USFWS) should it be determined that their actions may affect federally listed threatened or endangered species. Section 9 of FESA prohibits "take" (e.g., harm, harassment, pursuit, injury, kill) of federally listed wildlife. "Harm" is further defined to include habitat modification or degradation where it kills or injures wildlife by impairing essential behavioral patterns such including breeding, feeding, or sheltering. Take that is incidental to otherwise lawful activities can be authorized under Section 7 of FESA.

Procedures for obtaining a permit for incidental take are identified under Section 7 of FESA for federal properties or where federal actions are involved and are identified under Section 10 of FESA for non-federal actions. During the Section 7 process, measures to avoid and minimize project effects to listed species and their habitat will be identified and incorporated into a Biological Opinion (prepared by the USFWS) that includes an incidental take by the federal agency and applicant.

The County of Riverside has been issued a Section 10(a) permit for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), discussed below.

2.1.2) Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711) is an international treaty that makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Executive Order 13186 ensures that

environmental analyses of federal actions required by the National Environmental Policy Act (NEPA) or other established environmental review processes evaluate the effects of actions on migratory birds, with emphasis on species of concern. Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) or loss of habitat upon which the birds depend could be considered "take" and constitute a violation of the MBTA.

2.2) State

2.2.1) California Endangered Species Act

California Endangered Species Act (CESA) definitions of endangered and threatened species parallel those defined in the FESA. The CESA defines an endangered species as ". . . a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes including loss of habitat, change in habitat, overexploitation, predation, competition or disease." Endangered species are in serious danger of becoming extinct and threatened species are likely to become endangered species in the foreseeable future (according to Sections 2062 and 2067, respectively, of the California Fish and Game Code). Candidate species are those under formal review by the CDFW for listing as endangered or threatened (Section 2067). Prior to being considered for protected status, the CDFW designates a species as being of special concern. Species of Special Concern are wildlife species for which the CDFW has information indicating population decline. Plant species of concern are designated by California Rare Plant Ranks.

2.2.2) California Natural Diversity Database

The California Natural Diversity Database (CNDDB) includes documented occurrences of special status species that have been reported to the CDFW. It also includes ranks of overall condition of sensitive species and vegetation communities on global (throughout its range) and state (within California) levels. State ranking is numerical, ranging from one to five (S1 to S5), with one indicating very few remaining individuals or little remaining habitat and five indicating a demonstrably secure to ineradicable population condition.

2.2.3) California Rare Plant Ranks

The California Native Plant Society (CNPS) Inventory of Rare and Endangered Species includes documented occurrences of special status plant species that are available through the

Consortium of California Herbaria and other sources. The CNPS, in coordination with CDFW, has cataloged California's rare and endangered plants into lists according to population distributions and viability. These lists are numbered and indicate the following California Rare Plant Ranks (CRPR): (1A) presumed extinct in California; (1B) rare, threatened, or endangered throughout their range; (2A) presumed extirpated in California, but more common in other states; (2B) threatened or endangered in California, but more common in other states; (3) more information is needed to establish rarity; and (4) plants of limited distribution in California (i.e., naturally rare in the wild), but whose populations do not appear to be susceptible to threat. A CRPR may also have an extension (e.g., 1B.x) that indicates current level of threat: seriously threatened (x.1), moderately threatened (x.2), or not very threatened (x.3).

2.2.4) California Environmental Quality Act

The California Environmental Quality Act (CEQA) and CEQA Guidelines (§ 15000 et seq.) require identification of environmental effects from discretionary projects. Significant effects are to be mitigated by avoidance, minimization, rectification, or compensation whenever possible.

Effects to all state and federal listed species are considered significant under CEQA. In addition to formally listed species, CEQA considers effects to species that are demonstrably endangered or rare as important or significant. These definitions can include state designated species of special concern, federal candidate and proposed species, CNDDB tracked species, and CRPR list 1B and list 2 plants.

Appendix G of the CEQA Guidelines specifically addresses biological resources and encompasses a broad range of resources to be considered.

2.2.5) California Fish and Game Code, Sections 3503 and 3513

California Fish and Game Code Section 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; Section 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and Section 3513 provides for the adoption of the provisions of the federal Migratory Bird Treaty Act.

2.3) Local

2.3.1) Western Riverside County Multiple Species Habitat Conservation Plan

The County of Riverside, including eight (8) additional land jurisdictions and 14 cities, have prepared a Multiple Species Habitat Conservation Plan (MSHCP) for western Riverside County. The MSHCP will build upon existing preserves and provide connectivity and wildlife corridors throughout the region. The MSHCP proposes to conserve approximately 500,000 acres and 146 different species. Approximately 347,000 acres are anticipated to be conserved on existing Public/Quasi-Public lands with additional contributions of approximately 153,000 acres from willing sellers (http://www.rcip.org).

The MSHCP was approved by the county on June 17, 2003 and an Implementation Agreement (IA) between the USFWS, the CDFW, and the County was executed and an associated USFWS Section 10(a)(1)(B) Permit (No. TE-088609) was issued on June 22, 2004. The permit grants take authorization for certain species identified in the permit as "Covered Species Adequately Conserved."

The MSHCP establishes seven (7) core reserve areas and associated linkages between proposed and existing core areas. The MSHCP divides areas into Cells using USGS coordinates. According to the Riverside County Integrated Project website, parcels that compose the current project site are located within Sun City/Menifee Valley Area Plan. Conservation efforts for the project site will be evaluated with regard to sensitive species identified as not adequately conserved and observed onsite, riverine/riparian or vernal pool habitat and their associated sensitive species (if located onsite), fairy shrimp, jurisdictional areas, and sage scrub.

Focused surveys are required for species identified as not adequately conserved under the MSHCP if suitable habitat is present onsite. If focused surveys are determined necessary and species identified as not adequately conserved under the MSHCP occur onsite, the proponent may be required to undergo a Habitat Acquisition and Negotiation Strategy (HANS) determination with the County of Riverside. If a single family home or mobile home is to be placed on an existing legal lot, permitting will be reviewed according to the procedures outlined in MSHCP Section 6.1.1, *Expedited Review Process for Single-Family Homes or Mobile Homes To Be Located on an Existing Lot Within the Criteria Area*.

Section B (Species Accounts) of Volume 2 of the MSHCP (Dudek 2003) lists the following objectives for burrowing owl conservation/protection:

Objective 1

Include within the MSHCP Conservation Area at least 27,470 acres of suitable primary habitat for the burrowing owl including grasslands.

Objective 2

Include within the MSHCP Conservation Area at least 5 Core Areas and interconnecting linkages. Core areas may include the following: (1) Lake Skinner/Diamond Valley Lake area (Existing Core C plus Proposed Extension of Existing Cores 5, 6, 7; 29,060 acres); (2) playa west of Hemet (Proposed Noncontiguous Habitat Block 7; 1,250 acres); (3) San Jacinto Wildlife Area/Mystic Lake area including Lake Perris area (Existing Core H; 17,470 acres); (4) Lake Mathews (Existing Core C plus Proposed Extension of Existing Cores 2; 23,710 acres); and (5) along the Santa Ana River (9,670 acres). The Core Areas should support a combined total breeding population of approximately 120 burrowing owls with no fewer than five pairs in any one Core area.

Objective 3

Include within the MSHCP Conservation Area at least 22,120 acres of suitable secondary habitat for the burrowing owl including playas and vernal pools, and agriculture outside of the Core Areas identified above. Areas where additional suitable habitat could be conserved include west of the Jurupa Mountains, near Temescal Wash (i.e., vicinity of Alberhill), near Temecula Creek, within the Lakeview Mountains, Banning, the Badlands, Gavilan Hills, and Quail Valley.

Objective 4

Include within the MSHCP Conservation Area the known nesting locations of the burrowing owl at Lake Perris, Mystic Lake/San Jacinto Wildlife area, Lake Skinner area, the area around Diamond Valley Lake, playa west of Hemet, Lakeview Mountains, Lake Mathews/Estelle Mountain Reserve and Sycamore Canyon Regional Park.

Objective 5

Surveys for burrowing owl will be conducted as part of the project review process for public and private projects within the burrowing owl survey area where suitable habitat is present (see Burrowing Owl Survey Area Map, Figure 6-4 of the MSHCP, Volume I). The locations of this species determined as a result of survey efforts shall be conserved in accordance with procedures described within Section 6.3.2, MSHCP, Volume I and the guidance provided below:

Burrowing owl surveys shall be conducted utilizing accepted protocols as follows. If burrowing owls are detected on the project site then the action(s) taken will be as follows:

If the site is within the Criteria Area, then at least 90 percent of the area with long-term conservation value will be included in the MSHCP Conservation Area. Otherwise:

1) If the site contains, or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and the

surrounding area supports fewer than 3 pairs of burrowing owls, then the on-site burrowing owls will be passively or actively relocated following accepted protocols.

2) If the site (including adjacent areas) supports three or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs will be conserved onsite.

The survey and conservation requirements stated in this objective will be eliminated when it is demonstrated that Objectives 1 – 4 have been met.

Objective 6

Pre-construction presence/absence surveys for burrowing owl within the survey area where suitable habitat is present will be conducted for all Covered Activities through the life of the permit. Surveys will be conducted within 30 days prior to disturbance. Take of active nests will be avoided. Passive relocation (use of one-way doors and collapse of burrows) will occur when owls are present outside the nesting season.

Objective 7

Translocation sites for the burrowing owl will be created in the MSHCP Conservation Area for the establishment of new colonies. Translocation sites will be identified, taking into consideration unoccupied habitat areas, presence of burrowing mammals to provide suitable burrow sites, existing colonies and effects to other Covered Species. Reserve Managers will consult with the Wildlife Agencies regarding site selection prior to translocation site development.

3.0) METHODS AND PERSONNEL

3.1) Literature Review

Pertinent literature was reviewed to identify local occurrences and habitat requirements of special status species and communities occurring in the region. Literature reviewed included compendia provided by resource agencies (CDFW 2019a, 2019b; USFWS 2019), the Western Riverside County MSHCP (Dudek 2003), California Natural Diversity Database (CNDDB; CDFW 2019c) reports for the vicinity, and reports of previous surveys completed for the site (L&L 2003-2018).

Latin names of plants follow *The Jepson Manual* (Hickman 1993) with updates from the online Jepson eFlora (Jepson 2019). Latin names of animals follow *A Field Guide to Western Reptiles and Amphibians* (Stebbins 1985), *California Mammals* (Jameson and Peeters 1988), *Checklist of North American Birds* (American Ornithologists' Union 1983, 1989) and *The Sibley Guide to Birds* (Sibley 2000), and *American Insects: A Handbook of the Insects of America North of Mexico* (Arnett 2000). Vegetation community classifications follow Sawyer et al. (2009). Current conservation status of plant and wildlife species determined from CDFW (2019a, 2019b). Other sources consulted for information regarding biological resources include Brown (1994), Recon (1985), Schoenherr (1990), and Small (1994).

3.2) Survey Methods

A habitat assessment, burrow survey, and focused burrowing owl surveys were conducted on five (5) site visits in April, May, and June 2019 (Table 1). The surveys were conducted in accordance with the Burrowing Owl Survey Instructions for the MSHCP.

MSHCP Burrowing Owl Survey Instructions require surveys to be conducted during the breeding season from March 1 to August 31. Surveys should be conducted during weather conditions that are conducive to detecting owls and owl sign. Surveys are not acceptable if they are conducted during rain, high winds (> 20 mph), dense fog, or temperatures over 90° F.

Surveys should be conducted in the morning one (1) hour before sunrise to two (2) hours after sunrise or in the early evening two (2) hours before sunset to one (1) hour after sunset. Surveys were generally conducted in the early morning hours.

Surveys were conducted by L&L field biologist Guy Bruyea, who has extensive experience with surveys for burrowing owl and nesting birds. Weather conditions during the surveys are summarized in Table 1.

Table 1. Survey Information.

Date	Time	Sunrise*	Sunset*	Weather	Wind (mph)
04.16.2019	1630-1900	--	1925	Cloudy, 66-63º F	2-4
05.15.2019	1700-1930	--	1947	Cloudy, 74-69º F	1-4
05.28.2019	1630-1930	--	1956	Sunny/Clear, 72-68º F	1-5
06.21.2019	0700-0830	0542	--	Marine layer/Clear, 61-67º F	0-1
06.23.2019	1815-1930	--	2007	Clear, 77-71º F	0-1

*sunrise/sunset times from timeanddate.com

A total of about 10.75 person-hours were spent onsite. The site was examined for suitable burrow sites and for signs of occupation by burrowing owl, including pellets, feathers, whitewash, prey remains, and eggshell fragments, as well as individual owls. Particular attention was paid to the location of the potentially occupied burrow observed in 2018.

A search for potentially suitable burrows within dirt, wood, and rock debris piles, artificially created berms, and other locations was conducted during the surveys. The surveys were concentrated in areas typically associated with burrowing owl habitat, including open areas onsite and areas where California ground squirrel activity (i.e., suitable burrows) was expected. An additional 150-meter (500-foot) buffer area surrounding the site was visually inspected, where possible, in areas identified as potential burrowing owl habitat. Any developed areas were visually surveyed with binoculars due to trespassing concerns on private property.

Transects were walked throughout the property where suitable habitat is present. Coupled with binocular surveys of any restricted areas, this allowed for complete visual ground coverage of the survey area. Distance between transects was approximately 15 to 20 meters.

3.3) Species Information

3.3.1) Burrowing Owl

Burrowing owl (*Athene cunicularia*) is protected under the federal Migratory Bird Treaty Act and California Fish and Game Code and is a CDFW Species of Special Concern. Under the MSHCP, surveys are required in certain areas and mitigation is required as described in Section 2.3, above.

Burrowing owl is a small, ground-dwelling owl found in open dry grassland, desert, or shrubland areas and in uncultivated agricultural areas, rangelands, and other open areas with low-growing vegetation. It ranges throughout the western U. S., Canada, and Mexico. It is a small (approximately 9 to 11 inches in height) pale brown owl with white-colored "eyebrows" and throat, yellow eyes, a short stubby tail, and long legs. Males are generally larger and more lightly colored than females. Burrowing owl is the most diurnal of owl species but is considered mostly crepuscular (active around sunrise and sunset). Arthropods (mainly beetles and grasshoppers) make up a large portion of their diet, especially during the breeding season. Burrowing owls are opportunistic feeders and will readily eat small mammals (primarily mice, gophers, and ground squirrels), lizards, amphibians, and small birds.

Burrows are an essential element of burrowing owl habitat. Although burrowing owls can excavate their own burrows in soft soils, they typically inhabit abandoned burrows of small burrowing mammals, such as ground squirrels and pocket gophers. Burrowing owl has also been known to use man-made structures such as cement culverts, debris piles, and other artificial burrows. Occupancy of burrowing owl habitat can be verified at a site by observation of at least one (1) owl or its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance (CBOC 1993).

A site is considered occupied if at least one (1) owl has been identified onsite in the past three (3) years, because (if undisturbed) burrowing owls "exhibit high site fidelity, reusing burrows year after year" (Rich 1984, Feeny 1992). The range of this species is throughout the western United States and Mexico, but it is increasingly uncommon in southern California.

4.0) RESULTS

4.1) Literature Review Results

The project site is within the area covered by the Western Riverside County MSHCP. The MSHCP Conservation Summary Report identified the site as requiring an assessment of potential habitat and presence/absence of burrowing owl. This and previous reports fulfill the MSHCP requirement of habitat assessment and presence/absence surveys for burrowing owl. Figure 5 shows the project site in relation to MSHCP core areas and linkages.

The 2006 Final Environmental Impact Report (EIR) for the project (T&B 2006) includes a mitigation measure (4.3-2) requiring a pre-construction survey for burrowing owl within 30 days prior to grading. If burrowing owl is present, mitigation is required per the MSHCP:

> If the site contains or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and surrounding area supports less than 3 pairs of burrowing owls, then the on-site burrowing owls shall be passively or actively relocated following accepted protocols.
>
> If the site (including adjacent areas) supports 3 or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs shall be conserved on-site.

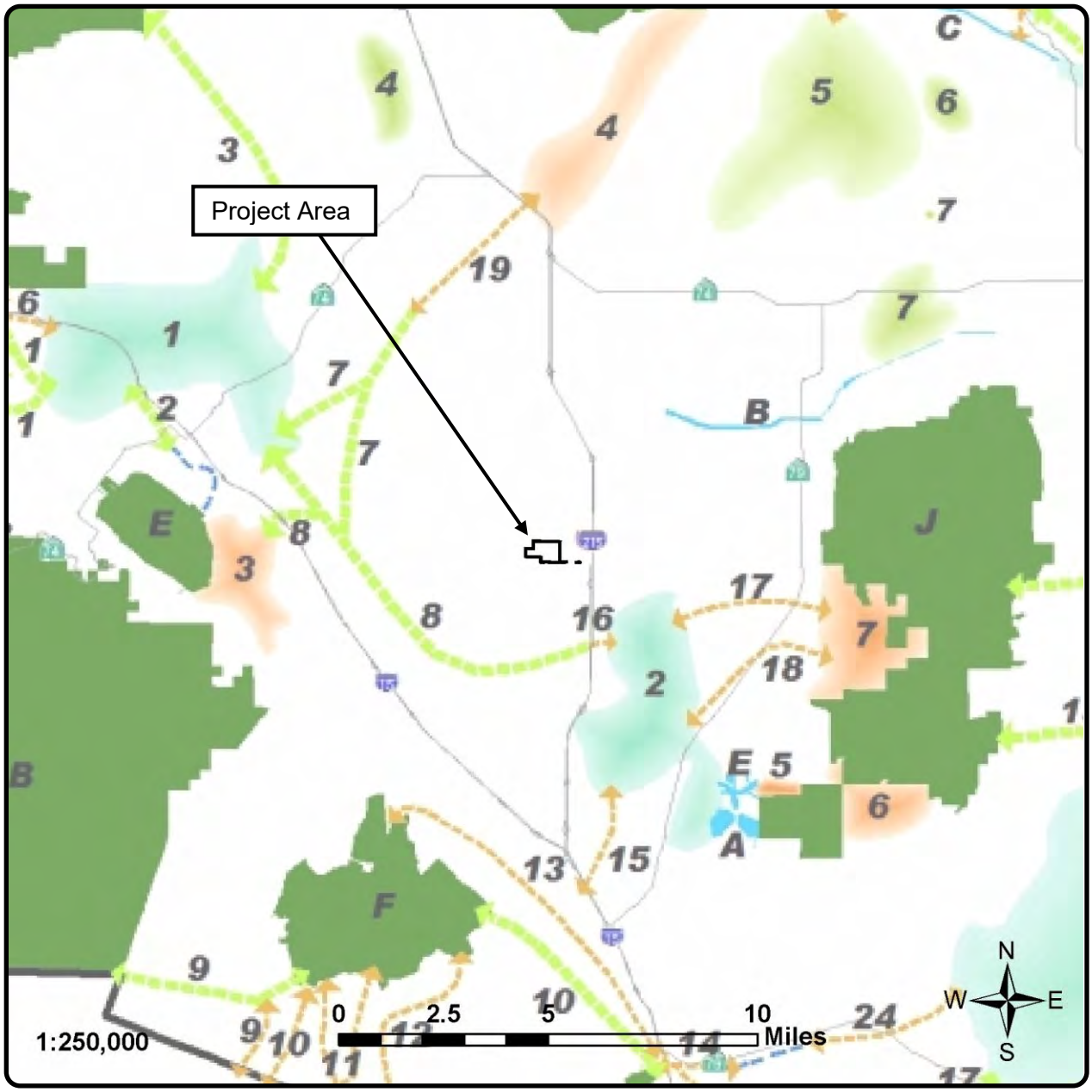

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Figure 5

MSHCP Cores and Linkages
(Riverside County MSHCP)

Golden Meadows, TT 31194
City of Menifee, California

4.2) Vegetation Communities

Much of the subject property has been disturbed by recent and historic cultivation and sheep grazing and does not support native habitat. The agricultural fields are dry farmed for wheat. During 2019, the fields were densely vegetated with non-native species including short-pod mustard, wild radish, and other non-native annuals. Some native species, such as large flower rancher's fiddleneck, were also present.

Less disturbed areas are also present, primarily in the northeastern portions of the site, with a mixture of disturbed and relatively undisturbed California buckwheat scrub and chamise chaparral. Sparse riparian vegetation and trees are found along the blue-line stream in the northwestern/central portion of the site (Figure 6).

Evidence of widespread sheep grazing was observed throughout all areas of the site in 2013. Hillsides containing California buckwheat scrub along the farmland edges, especially to the north and east, had been severely damaged by sheep grazing. Very few annuals remained (none in some areas) and many of the perennials have been stripped of vegetation and/or trampled. No evidence of recent sheep grazing was observed during surveys in 2017, 2018, and 2019 and regrowth of native annuals and perennials was observed in the buckwheat scrub areas.

Relatively undisturbed California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance) is present on the eastern and northern (primarily northeastern) portion of the site on south, west, and east-facing slopes containing numerous rocky outcrops. Native shrubs and other conspicuous plants commonly observed in these areas include California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemisia californica*), white sage (*Salvia apiana*), brittlebush (*Encelia farinosa*), yellow bush penstemon (*Keckiella antirrhinoides*), wishbone bush (*Mirabilis laevis* var. *crassifolia*), sweetbush (*Bebbia juncea*), blue elderberry (*Sambucus nigra* ssp. *cerulea*), and black sage (*Salvia mellifera*). Approximately 44.2 acres of California buckwheat scrub is present onsite and an additional ±0.6 acre is located within offsite improvement areas. Open patches can be found throughout portions of the buckwheat scrub onsite containing a mixture of native and non-native annuals. This vegetation community is ranked by CDFW (2018d) as S5 (secure – common, widespread, and abundant) and it is not considered sensitive.

Chamise chaparral (*Adenostema fasciculatum* Shrubland Alliance) or chamise–black sage chaparral (*Adenostema fasciculatum–Salvia mellifera* Shrubland Alliance) is found mainly in

small patches of remnant habitat, excluding the east-central property boundary where some relatively dense stands remain and mix with California buckwheat scrub. Common species found in the chaparral areas onsite are chamise (*Adenostoma fasciculatum*), black sage, and other perennials. Approximately ±2.1 acres of chaparral are present onsite, with an additional ±0.6 acre located within offsite improvement areas. CDFW ranks these chaparral communities as S5 and they are not considered sensitive.

Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance) and mulefat thickets (*Baccharis salicifolia* Shrubland Alliance) are present along a degraded blue-line stream in the northwestern/central portions of the site. This area is sparsely inhabited by arroyo willow (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), or a combination of these species. A single Fremont cottonwood tree (*Populus fremontii* ssp. *fremontii*) and scattered non-native tamarisks (*Tamarix* species) were also observed. The understory is dominated by mostly weedy annuals. Approximately 2.3 acres of this habitat is present onsite. CDFW ranks both of these communities as S4 (apparently secure – uncommon but not rare, some cause for long-term concern due to declines or other factors) and they are not considered sensitive.

Approximately 75 percent of the site is composed of agricultural areas under cultivation for wheat. During 2019 surveys, there was no crop evident and the fields were thickly vegetated with mainly non-native plants such as short-pod mustard and wild radish. Disturbed habitat on the site includes unvegetated areas (such as roads) and areas that contain mostly non-native plant species, including ornamentals and ruderal invasive species. There are ±158.5 acres of disturbed and/or agricultural land onsite, with an additional ±2.5 acres within offsite improvement areas.

4.3) Plant Species

Under the MSHCP, no surveys or assessments were required for Narrow Endemic, Criteria Area, or additional needs botanical species on the project site. The site does not support habitat, soils, and/or vegetation associated with naturally occurring vernal pools and would therefore not support associated special status plant species, nor were these species observed.

One (1) special status plant species was observed onsite in 2017, long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*; CRPR 1B.2). Two (2) plants were observed on clay soils in the northeast portion of the site along an east-west ridgeline. Under the MSHCP, this species is considered to be adequately conserved.

A list of all plant species identified onsite during past and present surveys is included in Appendix A.

4.4) Wildlife Species

A combined total of 59 wildlife species have been detected during all biological surveys of the site by L&L. A list of all wildlife species identified onsite is provided in Appendix A.

Biological surveys conducted on the project site by L&L from 2003 to 2018 (L&L 2003a, 2003b, 2004a, 2004b, 2004c, 2005, 2006a, 2006b, 2007, 2011, 2013, 2017, 2018b) detected the following special status species (Figures 7 through 10):

- coastal California gnatcatcher (*Polioptila californica californica*; federal threatened, CDFW Species of Special Concern, MSHCP Adequately Conserved),
- white-tailed kite (*Elanus leucurus*; California Fully Protected, MSHCP Adequately Conserved),
- coast horned lizard (*Phrynosoma blainvillii*; CDFW Species of Special Concern, MSHCP Adequately Conserved),
- coastal (western) whiptail (*Aspidoscelis tigris stejnegeri*; CDFW Species of Special Concern, MSHCP Adequately Conserved),
- northern harrier (*Circus cyaneus*; CDFW Species of Special Concern, MSHCP Adequately Conserved),
- San Diego black-tailed jackrabbit (*Lepus californicus bennetti*; CDFW Species of Special Concern, MSHCP Adequately Conserved),
- orange-throated whiptail (*Aspidoscelis hyperythra*; CDFW Watch List, MSHCP Adequately Conserved),
- Cooper's hawk (*Accipiter cooperi*; CDFW Watch List, MSHCP Adequately Conserved),
- California horned lark (*Eremophila alpestris actia*; CDFW Watch List, MSHCP Adequately Conserved),
- Costa's hummingbird (*Calypte costae*; CDFW Special Animal, not covered by MSHCP).
- great blue heron (fly over) (*Ardea herodias*; CDFW Special Animal, MSHCP Adequately Conserved),

All of these species are considered Adequately Conserved under the MSHCP except Costa's hummingbird, which is not covered under the MSHCP.

Two (2) special status species were observed or detected during the 2019 survey (Figure 11): coastal California gnatcatcher and California horned lark. Both were previously observed onsite.

4.4.1) Burrowing Owl

Previous focused surveys for burrowing owl (2005, 2006, 2007, 2011, and 2013) did not detect burrowing owls utilizing the site. However, one (1) location may have been used in the relatively recent past, based on presence of a single feather found during the 2013 survey at an entrance to a hole beneath a grouping of medium-sized rocks. No burrowing owl or sign was observed during 2017 general biological surveys.

Focused surveys in 2018 observed a single burrowing owl onsite and one (1) burrow with signs of occupation (Figure 10). The burrow was found very close to where the owl was observed. Pellets, scat, feathers, owl tracks, and pieces of shredded cloth were observed at the burrow entrance. It was not determined if the owl was using the burrow for nesting purposes. The burrow was surveilled during subsequent site visits, but there were no additional observations of burrowing owl adults or juveniles. Coyote and/or dog tracks were observed around the burrow, but the burrow itself was not disturbed and there were no signs that owls had been predated. No other active burrows or burrowing owls were observed during surveys in 2018.

Focused surveys in 2019 did not detect any burrowing owl, occupied burrows, or owl sign. The agricultural fields on the site, including the site of the 2018 burrow observation, had tall, dense non-native vegetation. This vegetation created unsuitable conditions for burrowing owl. If future farming activities remove this vegetation, potentially suitable habitat may be present on the site again.

4.5) Jurisdictional Areas (MSHCP Riparian/Riverine and Vernal Pool Habitat)

The subject site contains woody, water-dependent vegetation. Arroyo willow, Fremont cottonwood, and mulefat are present within the mapped features (Figure 12). An ephemeral stream is present and mapped as a USGS blue-line stream. Surface water was not observed within any of the onsite drainage features during the 2013 or 2017 surveys. An updated jurisdictional delineation was completed in 2011, revised in 2013, and updated and verified in 2018 and 2019 (L&L 2011, 2018a, 2019).

Soil types within the study area are not consistent with an alkali playa or vernal pool complex and pools or depressions characteristic of vernal pool habitat were not noted as present onsite.

No MSHCP species listed for protection associated with riparian/riverine areas and vernal pools were observed. No fairy shrimp or potential fairy shrimp habitat was observed during this study.

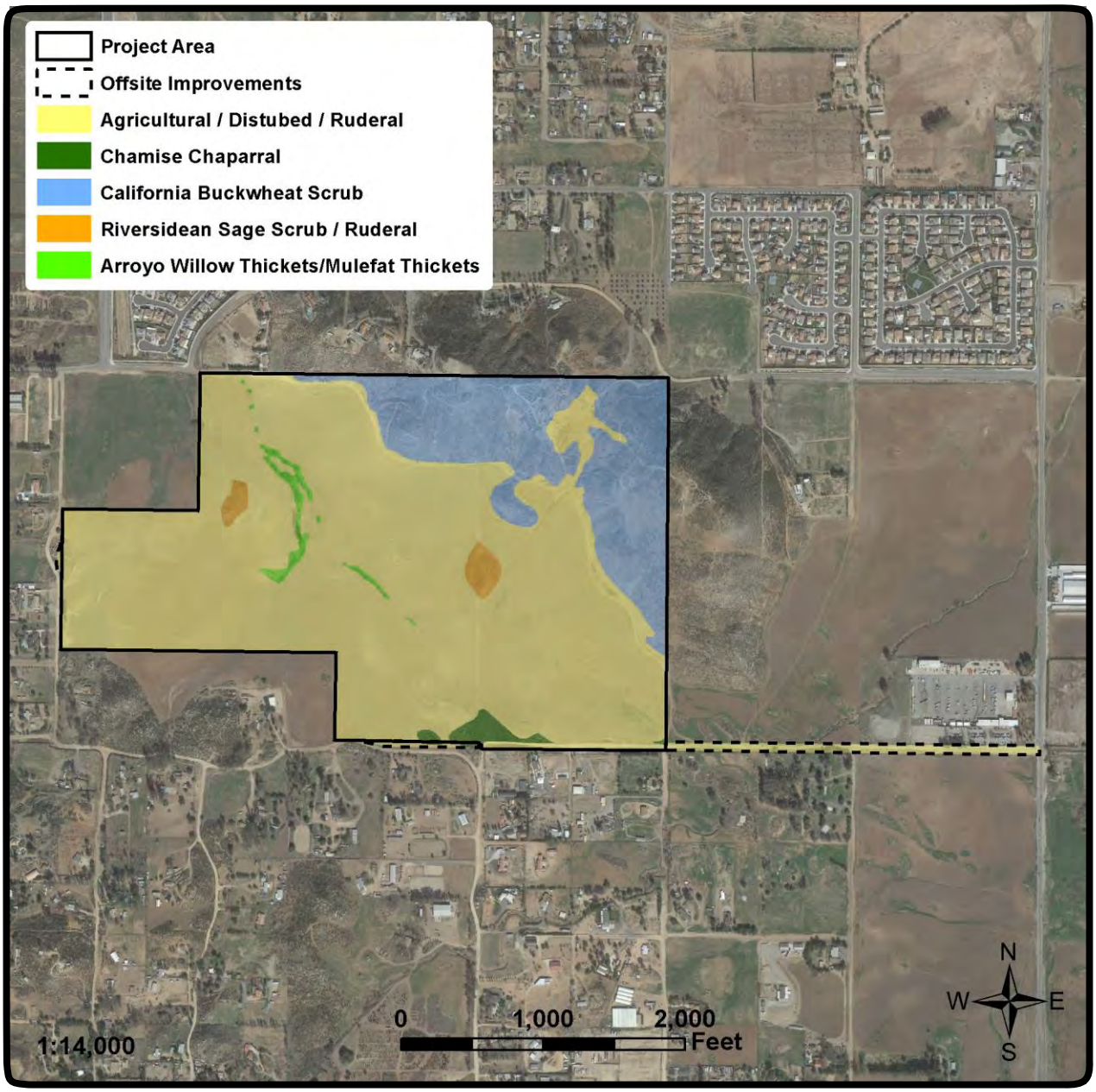

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Figure 6

Vegetation Community Map
(Photo obtained from Google Earth, February 2016)

Golden Meadows, TT 31194
City of Menifee, California

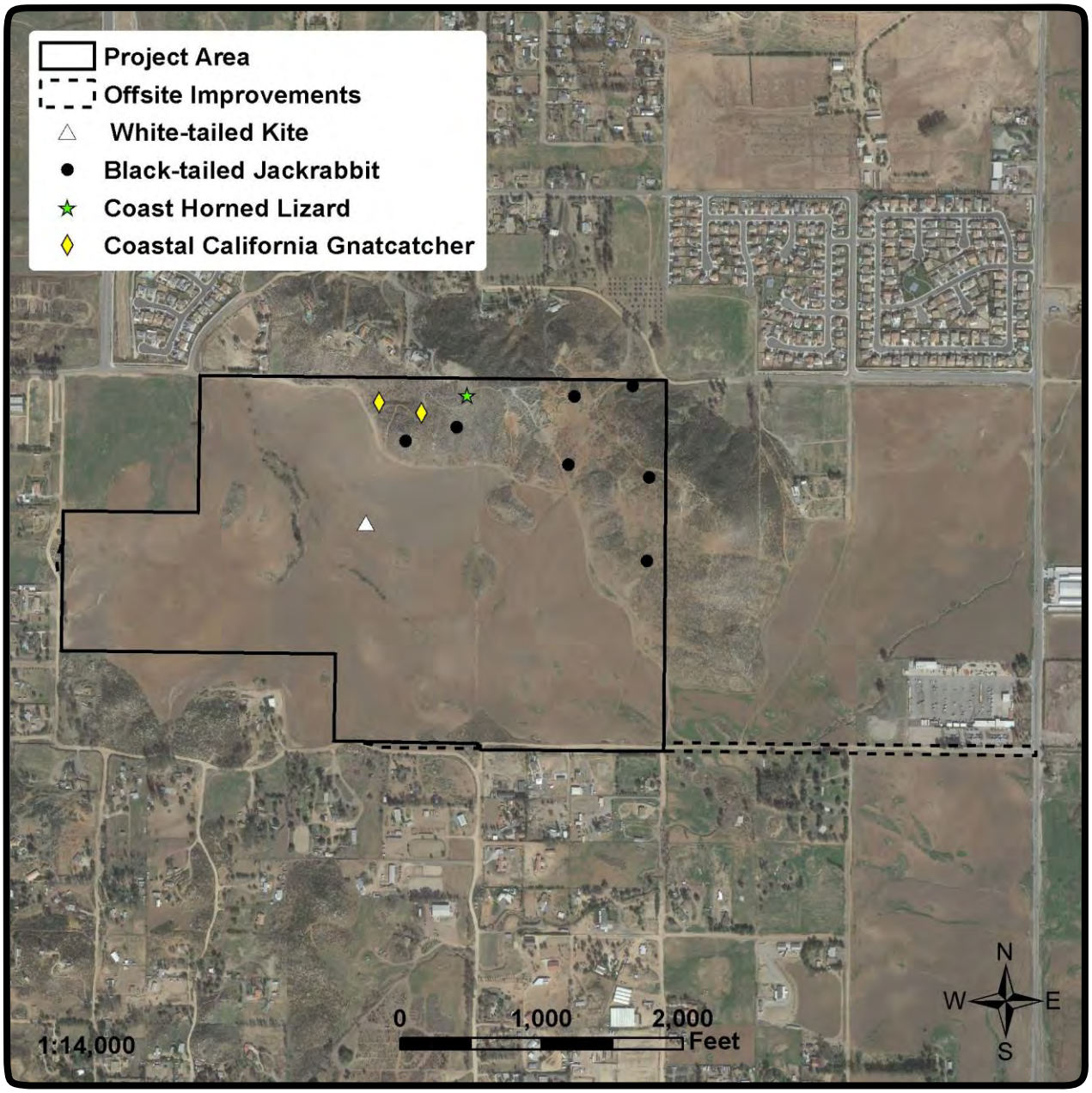

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Figure 7

Special Status Species – 2011
(Photo obtained from Google Earth, February 2016)

Golden Meadows, TT 31194
City of Menifee, California

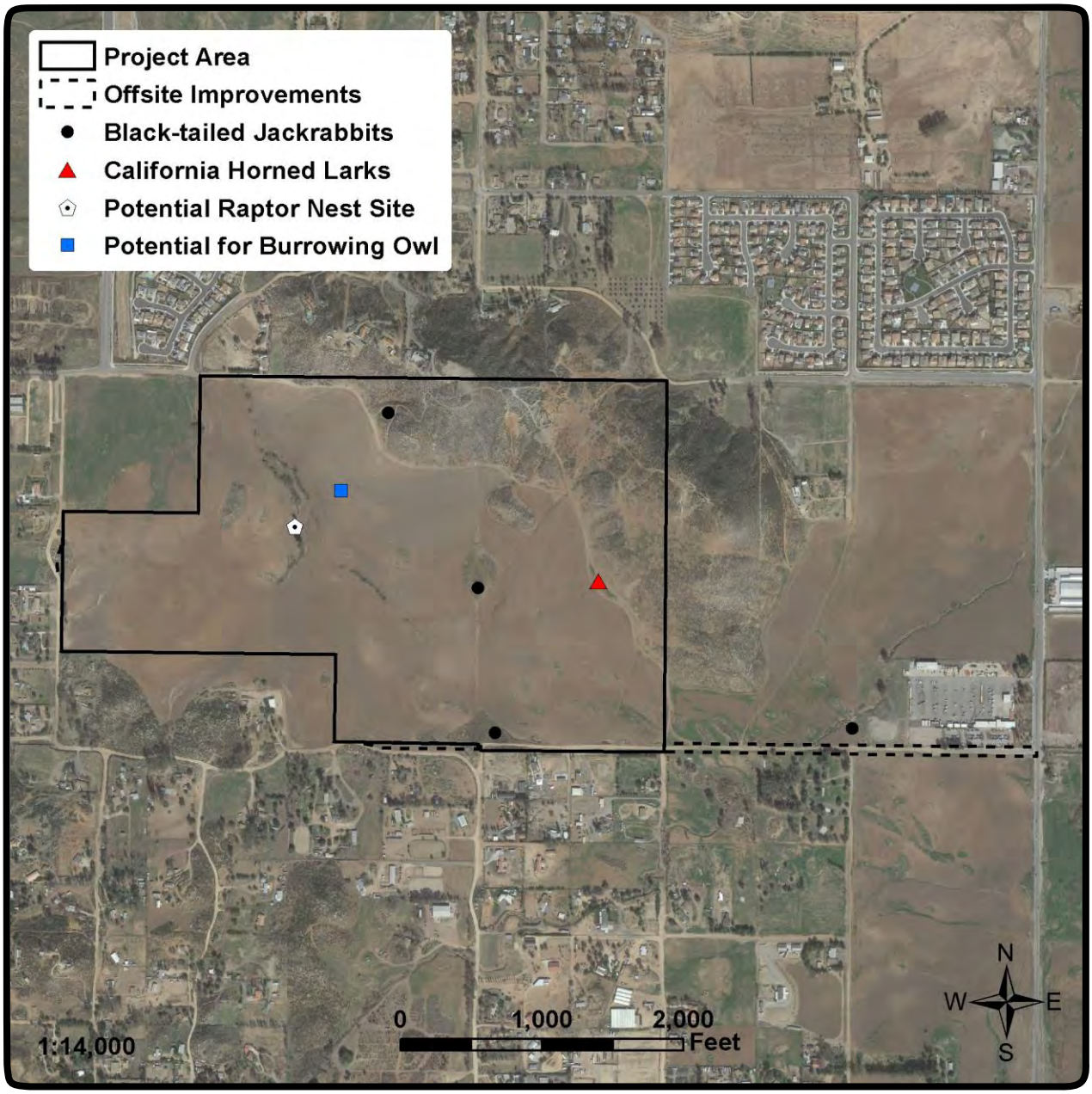

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Figure 8

Special Status Species – 2013
(Photo obtained from Google Earth, February 2016)

Golden Meadows, TT 31194
City of Menifee, California

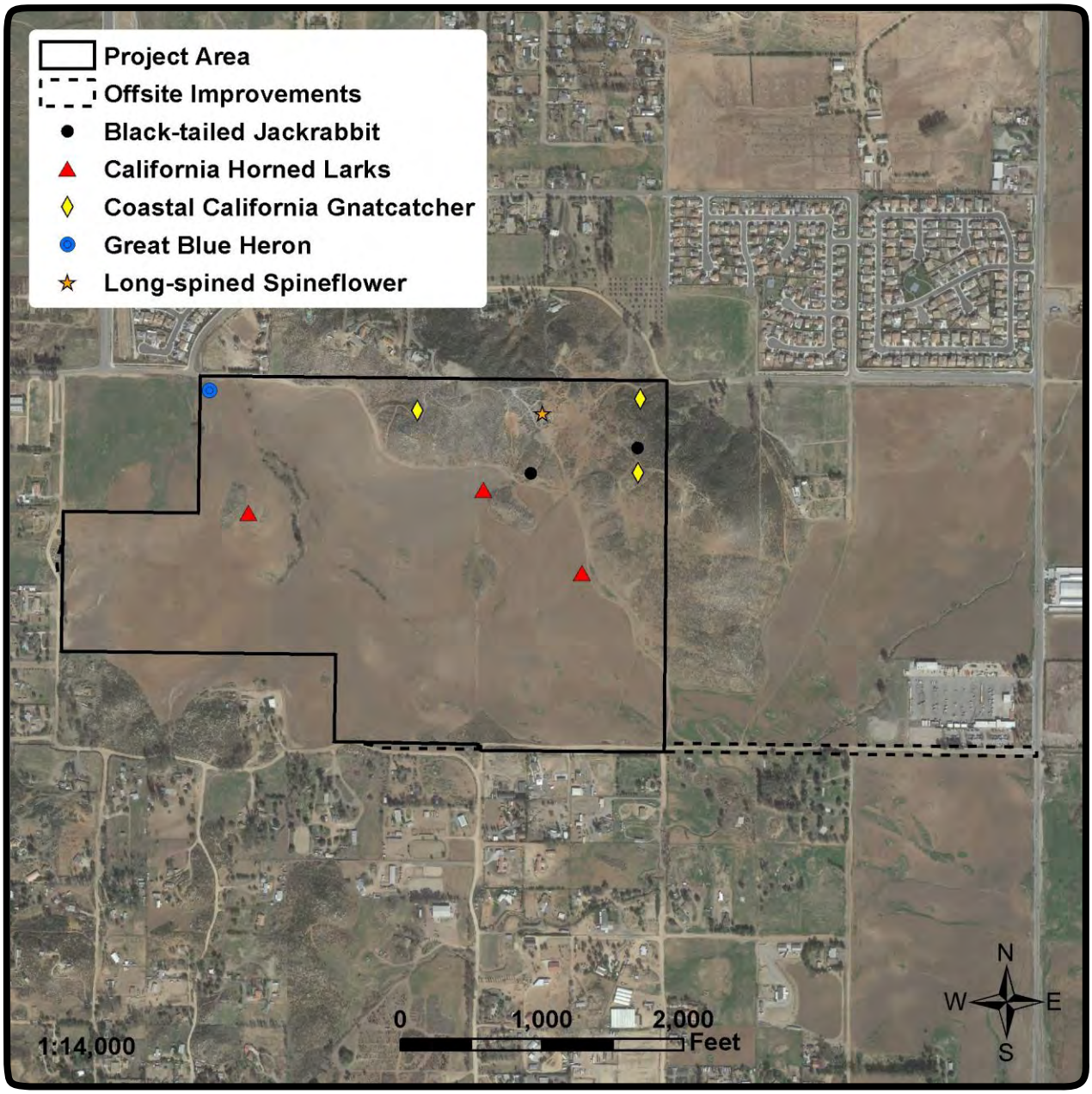

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Figure 9

Special Status Species – 2017
(Photo obtained from Google Earth, February 2016)

Golden Meadows, TT 31194
City of Menifee, California

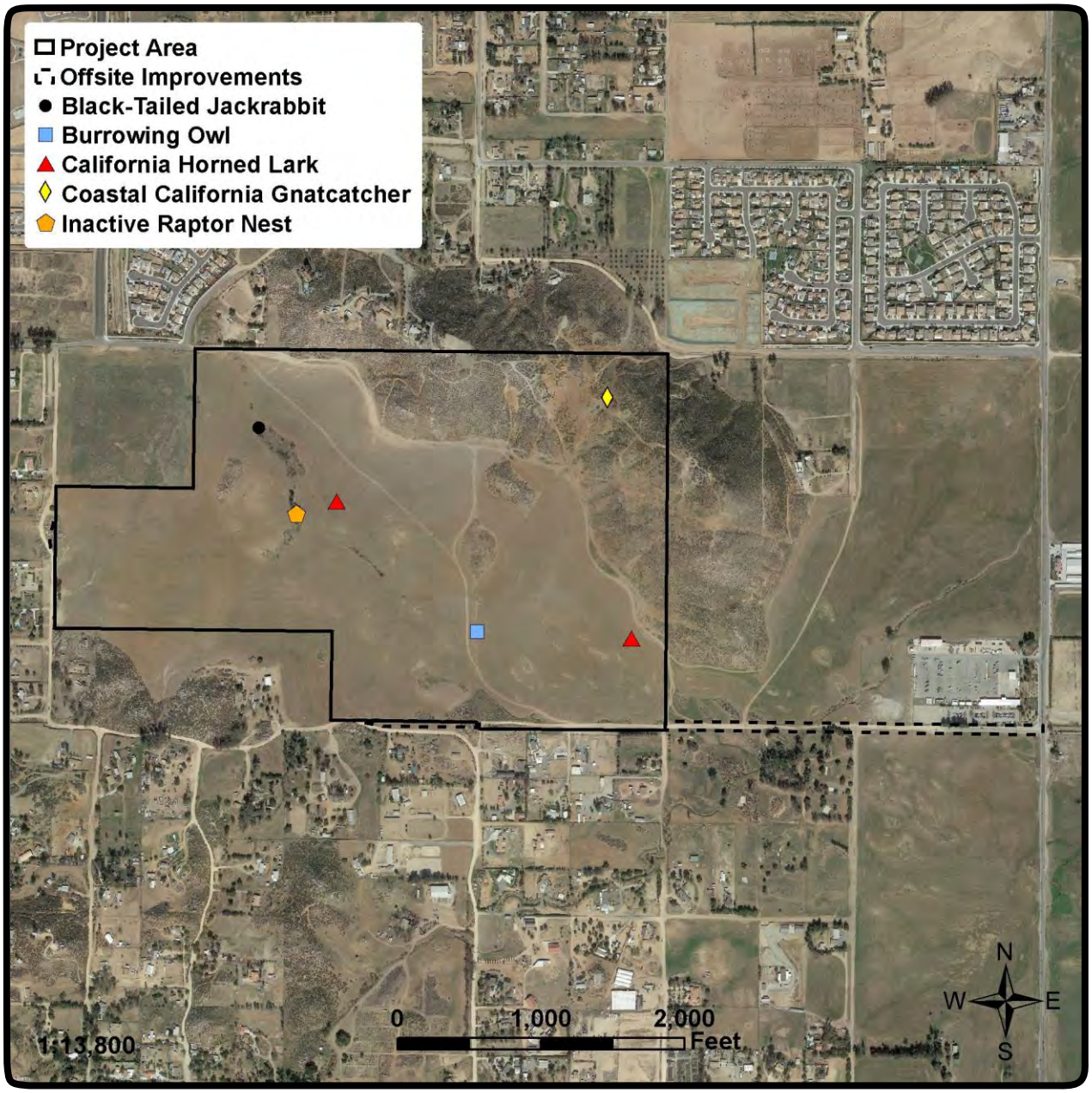

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Figure 10

Special Status Species – 2018
(Photo obtained from Google Earth, February 2018)

Golden Meadows, TT 31194
City of Menifee, California

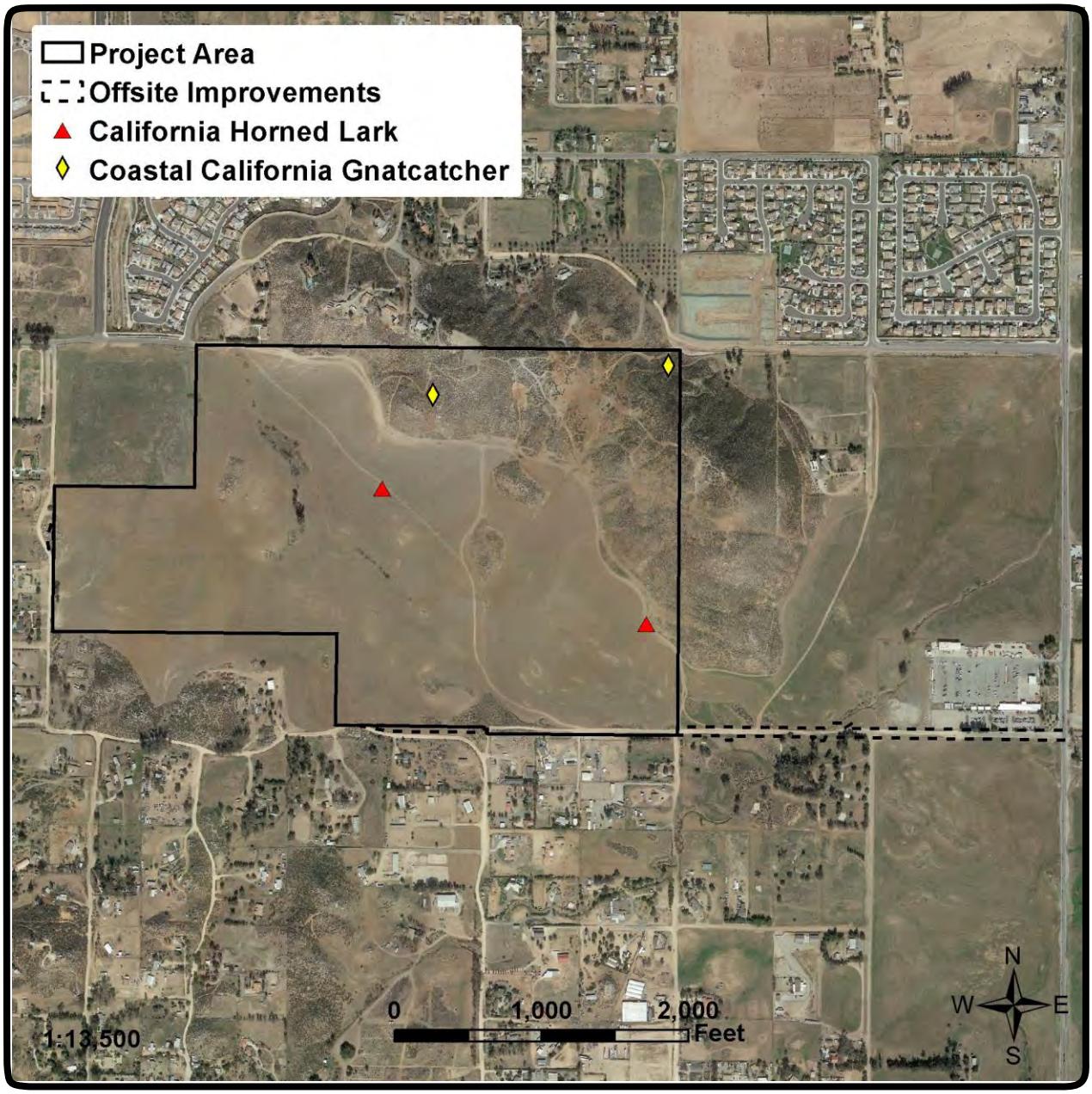

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Figure 11

Special Status Species – 2019
(Photo obtained from Google Earth, February 2018)

Golden Meadows, TT 31194
City of Menifee, California

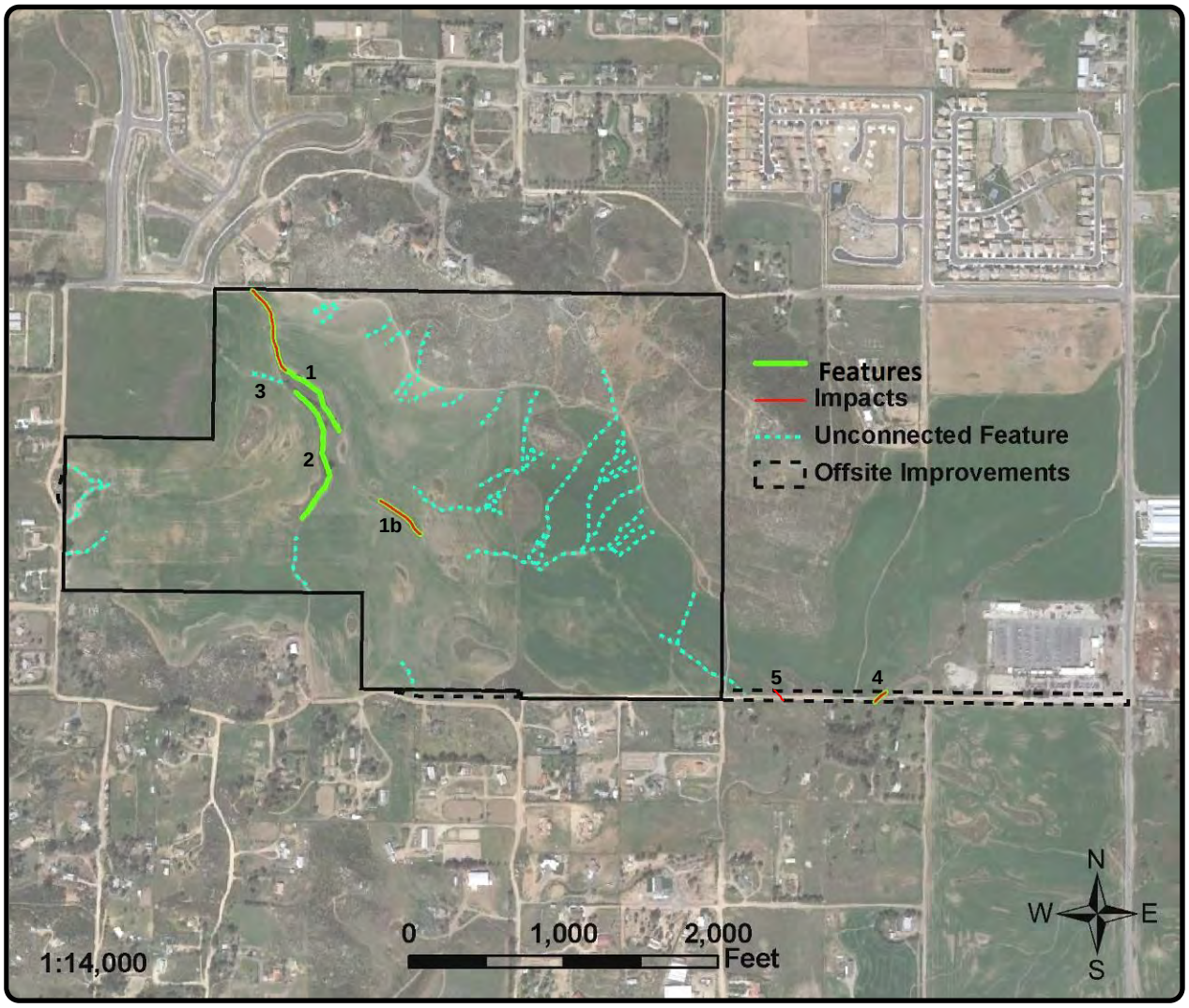

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Figure 12

Jurisdictional Areas (2019)
(Photo obtained from Google Earth, 3-9-2011)

Golden Meadows, TT 31194
City of Menifee, California

5.0) IMPACTS AND RECOMMENDATIONS

The purpose of this study was to identify biological resources on the project site, specifically burrowing owl.

The impacts and recommendations identified are based on the literature review, knowledge of species and habitats in the site vicinity, and the biological field survey. The information in this section is intended to serve as a planning tool for making decisions about future development of the project site.

No burrowing owl, occupied burrows, or owl sign were observed onsite during the breeding season survey in 2019. The agricultural fields on the site, including the site of the 2018 burrow observation, had tall, dense non-native vegetation. This vegetation created unsuitable conditions for burrowing owl. If future farming activities remove this vegetation, potentially suitable habitat may be present on the site again. A preconstruction burrowing owl survey is recommended. Annual burrowing owl surveys are advisable until the project reaches the construction stage.

Trees and other vegetation and habitat suitable for nesting birds are present within and around the site and a potential raptor nest site (unoccupied) is present onsite. Based upon presence of potential nesting habitat, a preconstruction clearance survey for nesting birds, including raptors, is recommended prior to any site disturbance during the nesting season (generally February 1 through August 31). If nesting birds are present, avoidance of nests will be required and a buffer of at least 500 feet is recommended until juvenile birds have fledged and/or an authorized biologist has verified that the nest has become inactive.

Previous surveys identified one (1) special status plant species, long-spined spineflower. Under the MSHCP, this species is considered to be Adequately Conserved. Special status wildlife species observed during surveys include coastal California gnatcatcher, California horned lark, San Diego black-tailed jackrabbit, great blue heron, coast horned lizard, Cooper's hawk, white-tailed kite, northern harrier, and Costa's hummingbird. All of these species are considered Adequately Conserved under the MSHCP except Costa's hummingbird, which is not covered under the MSHCP.

Soil types are not consistent with an alkali playa or vernal pool complex and pools or depressions characteristic of vernal pool habitat were not identified onsite. No MSHCP species

listed for protection associated with riparian/riverine areas and vernal pools were observed. No fairy shrimp or potential fairy shrimp habitat was observed during this study.

Jurisdictional areas were identified onsite and have been reported previously. Regulatory permits will be required for impacts to jurisdictional areas.

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APPENDIX A: Plant and Wildlife Species

Table 2. Plant and wildlife species. Plant and wildlife species identified on the Golden Meadows site during surveys from 2003 to 2018. One asterisk (*) indicates a non-native species; two asterisks (**) indicates a special status species; a question mark (?) indicates uncertainty regarding identification or native status. Wildlife species list excludes invertebrates.

Plants [N=115]

	Scientific Name	Common Name
	VASCULAR PLANTS	
	Dicotyledons	
	ADOXACEAE	**MUSKROOT FAMILY**
	Sambucus nigra ssp. *cerulea* *(S. mexicana)*	Mexican elderberry, blue elderberry
	AMARANTHACEAE	**AMARANTH FAMILY**
*	*Amaranthus albus*	Tumbleweed, tumbling pigweed
	ANACARDIACEAE	**SUMAC or CASHEW FAMILY**
*	*Schinus molle*	Peruvian pepper tree
	APIACEAE	**CELERY FAMILY**
	Daucus pusillus	Rattlesnake weed, wild carrot
	ASTERACEAE	**ASTER FAMILY**
	Acourtia microcephala *(Perezia microcephala)*	Scapellote, perezia
	Ambrosia acanthicarpa	Annual bur-sage, annual sandbur
*	*Anthemis cotula*	Mayweed, dog mayweed
	Artemisia californica	California sagebrush
	Baccharis salicifolia (B. glutinosa)	Mulefat
	Bebbia juncea	Sweetbush
*	*Centaurea melitensis*	Tocalote
	Chaenactis artemisiifolia	White pincushion, wormwood pincushion
	Corethrogyne filaginifolia var. *filaginifolia* *(Lessingia filaginifolia)*	California-aster, sand-aster
	Deinandra fasciculata *(Hemizonia fasciculata)*	Fascicled tarplant, slender tarweed
	Encelia farinosa	Brittlebush
	Erigeron canadensis *(Conyza canadensis)*	Horseweed, mare's tail
	Eriophyllum confertiflorum	Golden-yarrow

	Eriophyllum multicaule	Many-stem woolly daisy
	Gutierrezia californica (G. bracteata)	California matchweed
	Helianthus annuus	Western sunflower
*	*Lactuca serriola*	Prickly lettuce
	Lasthenia californica (L. chrysostoma)	California goldfields
	Layia platyglossa	Tidy-tips
	Logfia filaginoides (Filago californica)	California filago
*	*Matricaria discoidea (Chamomilla suaveolens, M. matricarioides)*	Pineapple weed
	Rafinesquia californica	California chicory
*	*Senecio vulgaris*	Common groundsel
*	*Sonchus oleraceus*	Common sow thistle
	Stephanomeria virgata	Wreath plant
	Stylocline gnaphaloides	Everlasting neststraw
	Tetradymia comosa	Hairy horsebrush, common-thorn
	Uropappus lindleyi (Microseris lindleyi, M. linearifolia)	Silverpuffs
*?	*Xanthium spinosum*	Spiny cocklebur

BORAGINACEAE **BORAGE OR WATERLEAF FAMILY**

	Amsinckia intermedia (A. menziesii var. intermedia)	Large flower rancher's fiddleneck
	Cryptantha intermedia	Common cryptantha
	Heliotropium curassavicum	Wild heliotrope
	Pectocarya linearis	Slender pectocarya
	Phacelia minor	Wild Canterbury bells
	Phacelia ramosissima	Branching phacelia
	Plagiobothrys sp.	Popcornflower

BRASSICACEAE **MUSTARD FAMILY**

*	*Brassica nigra*	Black mustard
*	*Hirschfeldia incana (Brassica geniculata)*	Shortpod mustard
	Lepidium nitidum	Shining peppergrass
*	*Raphanus sativus*	Wild radish
*	*Sisymbrium irio*	London rocket
*	*Sisymbrium orientale*	Wild mustard, hare's ear cabbage
	Thysanocarpus curvipes	Lacepod

CACTACEAE **CACTUS FAMILY**

	Cylindropuntia californica var. *parkeri (Opuntia parryi)*	Valley cholla

CHENOPODIACEAE **GOOSEFOOT FAMILY**

*	*Chenopodium murale*	Nettle-leaved goosefoot, lamb's quarters
*	*Salsola tragus*	Russian thistle
CONVOLVULACEAE		**MORNING-GLORY FAMILY**
	Calystegia macrostegia	Morning-glory
	Cuscuta californica	Chaparral dodder, witch's hair
CRASSULACEAE		**STONECROP FAMILY**
	Crassula connata (C. erecta)	Pygmy-weed, pygmy stonecrop
CUCURBITACEAE		**GOURD FAMILY, CUCUMBER FAMILY**
	Cucurbita foetidissima	Calabazilla
	Marah macrocarpa	Chilicothe, wild cucumber
EUPHORBIACEAE		**SPURGE FAMILY**
	Croton setiger (C. setigerus, Eremocarpus setiger, E. setigerus)	Turkey-mullein, doveweed
	Euphorbia albomarginata (Chamaesyce albomarginata)	Rattlesnake sandmat, rattlesnake weed
FABACEAE		**LEGUME FAMILY, PEA FAMILY**
	Acmispon americanus (Lotus purshianus, L. unifoliatus)	"Spanish" clover
	Acmispon glaber (Lotus scoparius)	Deerweed
	Lupinus sp.	Unid. lupine
	Lupinus bicolor	Miniature lupine, dove lupine
*	*Medicago polymorpha*	California burclover
*	*Vicia villosa*	Winter vetch
GERANIACEAE		**GERANIUM FAMILY**
*	*Erodium botrys*	Long-beak filaree
*	*Erodium cicutarium*	Redstem filaree
LAMIACEAE		**MINT FAMILY**
*	*Marrubium vulgare*	Horehound
	Salvia apiana	White sage
	Salvia columbariae	Chia
	Salvia mellifera	Black sage
	Trichostema lanceolatum	Vinegar weed
MALVACEAE		**MALLOW FAMILY**
*	*Malva parviflora*	Cheeseweed
MYRSINACEAE		**MYRSINE FAMILY**
*	*Anagallis arvensis*	Scarlet pimpernel

MYRTACEAE		**MYRTLE FAMILY, EUCALYPTUS FAMILY**
*	*Eucalyptus* sp.	Ornamental eucalyptus
NYCTAGINACEAE		**FOUR O'CLOCK FAMILY**
	Mirabilis laevis var. *crassifolia (M. californica)*	Wishbone bush
ONAGRACEAE		**EVENING-PRIMROSE FAMILY**
	Camissonia sp.	Unid. evening-primrose
	Eulobus californica (Camissonia californica)	California false mustard, mustard evening primrose
PAPAVERACEAE		**POPPY FAMILY**
	Eschscholzia californica	California poppy
PHRYMACEAE		**LOPSEED FAMILY**
	Mimulus aurantiacus (M. puniceus, M. longiflorus)	Bush monkeyflower,sticky monkeyflower
	Mimulus guttatus	Seep monkeyflower
PLANTAGINACEAE		**PLANTAIN FAMILY**
	Antirrhinum nuttallianum	Nuttall snapdragon, violet snapdragon
	Keckiella antirrhinoides	Yellow bush-penstemon
	Plantago erecta	California plantain
POLEMONIACEAE		**PHLOX FAMILY**
	Eriastrum sapphirinum	Sapphire woollystar
	Navarretia hamata	Hooked navarretia
POLYGONACEAE		**BUCKWHEAT FAMILY**
	Chorizanthe fimbriata	Fringed spineflower
**	*Chorizanthe polygonoides* var. *longispina*	Long-spined spineflower
	Eriogonum fasciculatum var. *foliolosum*	Leafy California wild buckwheat, interior California buckwheat
	Eriogonum fasciculatum var. *polifolium*	Mojave Desert California buckwheat
*	*Polygonum aviculare ssp. depressum (P. arenastrum)*	Common knotweed
*	*Rumex crispus*	Curly dock
ROSACEAE		**ROSE FAMILY**
	Adenostoma fasciculatum	Chamise
RUBIACEAE		**MADDER FAMILY, COFFEE FAMILY**
*?	*Galium aparine*	Goose grass, annual bedstraw

SALICACEAE		**WILLOW FAMILY**
	Populus fremontii ssp. *fremontii*	Fremont cottonwood
	Salix lasiolepis	Arroyo willow
SCROPHULARIACEAE		**FIGWORT FAMILY, SNAPDRAGON FAMILY**
	Scrophularia californica	California figwort, coast figwort
SOLANACEAE		**NIGHTSHADE FAMILY**
	Datura wrightii (D. meteloides)	Jimsonweed, tolguacha
*	*Nicotiana glauca*	Tree tobacco
	Solanum americanum	
*?	*(S. nodiflorum)*	White nightshade
TAMARICACEAE		**TAMARISK FAMILY**
*	*Tamarix species*	Tamarisk
URTICACEAE		**NETTLE FAMILY**
*	*Urtica urens*	Dwarf nettle
ZYGOPHYLLACEAE		**CALTROP FAMILY**
*	*Tribulus terrestris*	Puncture vine

Monocotyledons

AGAVACEAE		**CENTURY PLANT FAMILY, AGAVE FAMILY**
	Hesperoyucca whipplei (Yucca whipplei)	Chaparral yucca
LILIACEAE		**LILY FAMILY**
	Calochortus splendens	Splendid mariposa lily
POACEAE		**GRASS FAMILY**
*	*Avena barbata*	Slender wild oat
*	*Avena fatua*	Wild oat
*	*Bromus species*	Non-native brome
*	*Bromus diandrus (B. rigidus)*	Ripgut brome
*	*Bromus madritensis* ssp. *rubens (B. rubens)*	Red brome
*	*Hordeum murinum*	Wall barley, hare barley
*	*Lamarckia aurea*	Goldentop grass
*	*Phalaris species*	Unid. canary grass
*	*Schismus barbatus*	Mediterranean schismus
*	*Triticum aestivum*	Common wheat (cultivated)
THEMIDACEAE		**BRODIAEA FAMILY**

Dichelostemma capitatum (D. pulchella, Brodiaea pulchella)	Blue dicks, wild hyacinth
Muilla maratima	Common muilla

* non-native species ** special status species

Wildlife [N=59]

	Scientific Name	**Common Name**
	VERTEBRATES	
	Reptiles	
	Iguanidae	Iguanid Lizards
	Sceloporus orcutti	Granite spiny lizard
	Uta stansburiana	Side-blotched lizard
	Phrynosomatidae	Spiny Lizards
**	*Phrynosoma blainvillii*	Coast horned lizard
	Teiidae	Whiptails and Relatives
**	*Aspidoscelis hyperythra*	Orange-throated whiptail
**	*Aspidoscelis tigris stejnegeri*	Coastal (western) whiptail
	Birds	
	Accipitridae	Hawks, Eagles, and Harriers
**	*Accipiter cooperii*	Cooper's hawk
	Buteo jamaicensis	Red-tailed hawk
**	*Circus cyaneus*	Northern harrier
**	*Elanus leucurus*	White-tailed kite
	Aegithalidae	Long-tailed Tits
	Psaltriparus minimus	Bushtit
	Alaudidae	Larks
**	*Eremophila alpestris actia*	California horned lark
	Apodidae	Swifts
	Aeronautes saxatalis	White-throated swift
	Ardeidae	Herons
**	*Ardea herodias*	Great blue heron (fly over)
	Cathartidae	Vultures
	Cathartes aura	Turkey vulture
	Charadriidae	Plovers
	Charadrius vociferus	Killdeer
	Columbidae	Pigeons and Doves
*	*Columba livia*	Rock dove, common pigeon
	Zenaida macroura	Mourning dove
	Corvidae	Crows and Jays
	Aphelocoma californica	California scrub jay
	Corvus brachyrhynchos	American crow

	Corvus corax	Common raven
Cuculidae		Cuckoos
	Geococcyx californianus	Greater roadrunner
Emberizidae		Emberizine Sparrows
	Amphispiza belli	Sage sparrow
	Melospiza melodia	Song sparrow
	Pipilo crissalis senicula	California towhee
	Zonotrichia leucophrys	White-crowned sparrow
Falconidae		Falcons
	Falco sparverius	American kestrel
Fringillidae		Finches
	Carduelis psaltria	Lesser goldfinch
	Haemorhous (Carpodacus) mexicanus	House finch
Hirundinidae		Swallows
	Petrochelidon pyrrhonota tachina	Cliff swallow
	Stelgidopteryx serripennis	Northern rough-winged swallow
Icteridae		Icterids
	Agelaius phoeniceus	Red-winged blackbird
	Euphagus cyanocephalus	Brewer's blackbird
	Icterus bullockii	Bullock's oriole
	Sturnella neglecta	Western meadowlark
Mimidae		Mockingbirds
	Mimus polyglottos polyglottos	Northern mockingbird
	Toxostoma redivivum	California thrasher
Odontophoridae		Quail
	Callipepla californica californica	California quail
Parulidae		Wood Warblers
	Dendroica coronata	Yellow-rumped warbler
Picidae		Woodpeckers
	Colaptes auratus	Northern flicker
	Picoides nuttallii	Nuttall's woodpecker
Polioptilidae		Gnatcatchers
	Polioptila caerulea	Blue-gray gnatcatcher
**	*Polioptila californica californica*	Coastal California gnatcatcher
Strigidae		Owls
**	*Athene cunicularia*	Burrowing owl
Sturnidae		Starlings
*	*Sturnus vulgaris*	European starling

Timaliidae		Babblers
	Chamaea fasciata	Wrentit
Trochilidae		Hummingbirds
	Calypte anna	Anna's hummingbird
**	*Calypte costae*	Costa's hummingbird
Troglodytidae		Wrens
	Catherpes mexicanus	Canyon wren
	Thryomanes bewickii	Bewick's wren
Turdidae		Thrushes
	Sialia mexicana	Western bluebird
Tyrannidae		Tyrant Flycatchers
	Sayornis nigricans	Black phoebe
	Sayornis saya	Say's phoebe
	Tyrannus verticalis	Western kingbird

Mammals

Canidae		Dogs, Foxes, and Coyotes
	Canis domesticus	Domestic dog
	Canis latrans	Coyote
Geomyidae		Pocket Gophers
	Thomomys bottae	Botta's pocket gopher (sign)
Leporidae		Rabbits
**	*Lepus californicus*	Black-tailed jackrabbit
	Sylvilagus audubonii	Audubon's cottontail
Sciuridae		Squirrels
	Spermophilus beecheyi	California ground squirrel

Table 3. Special Status Species Observations.

Species	Number	Date	Location on Site	GPS Coordinates (WGS 1984)	Elevation (feet)
CAGN	1	04.16.19	N central	N 33.655093, E -117.189888	1629
CAGN*	1	03.11.19	NE corner	N 33.655673, E -117.184620	1557
HOLA	S	04.16.19	SE	N 33.650844, E -117.185067	1557
HOLA	S	05.28.19	Central	N 33.653331, E -117.191005	1524
BTJA	1	06.14.18	NE	N 33.654478, E -117.193719	1512
HOLA	S	06.14.18	Central	N 33.653079, E -117.191911	1520
HOLA	S	05.24.18	SE	N 33.650510, E -117.185130	1548
BUOW	1	05.30.18	SE central	N 33.650610, E -117.188668	1536
CAGN	2 (pair)	05.24.18	NE corner	N 33.655112, E -117.185740	1576
CHPO	2	05.12.17	NE corner	N 33.655304, E -117.187238	~1600
CAGN**	2 (pair)	03.28.17	NE corner	N 33.655604, E -117.184969	1576
CAGN	1 (male)	03.28.17	NE corner	N 33.654170, E -117.185007	1656
CAGN	1 (male)	04.01.17	N central	N 33.655336, E -117.190141	1621
BTJA***	2	03.28.17	NE corner	N 33.654645, E -117.185019	1650
BTJA	2	04.01.17	N central	N 33.654137, E -117.187498	1583
GBHE	1	04.01.17	NW corner	N 33.655683, E -117.194971	fly over
HOLA	S	04.01.17	E central	N 33.652212, E -117.186278	1560
HOLA	S	04.08.17	W central	N 33.653324, E -117.194038	1519
HOLA	S	04.25.17	N central	N 33.653816, E -117.188586	1556
HOLA	20+	09.17.13	E central	N 33.65190, E -117.17614	1561
BTJA	1	---.---.13	N central	N 33.655294, E -117.1908176	1563
BTJA	1	---.---.13	Central	N 33.651907, E -117.188694	1545
BTJA	1	---.---.13	S central	N 33.649095, E -117.188265	1570
BTJA	1	---.---.13	E offsite	N 33.649251, E -117.179982	1513
BTJA	1	04.26.11	S central	N 33.64902, E -117.18801	1579
BTJA	1	04.26.11	Central	N 33.65179, E -117.18867	1546
BTJA	1	04.26.11	N central	N 33.65523, E -117.19081	1557
BTJA	7+	04.26.11	NW	Multiple locations, see Figure 9	-----
CAGN	2 (pair)	04.29.11	NW	N 33.65529, E -117.19003	1637
CAGN	1 (male)	04.26.11	NW	N 33.65548, E -117.19102	1557
CHL	1	04.26.11	NE	N 33.65564, E -117.18898	1723
WTKI	1	04.26.11	Central	N 33.653036, E -117.191520	fly over

BTJA=black-tailed jackrabbit, CAGN=coastal California gnatcatcher, CHL=coast horned lizard, CHPO=long-spined spineflower, GBHE=great blue heron, HOLA=California horned lark, WTKI=white-tailed kite.

S=several, no exact count. Observations may or may not represent the same individuals observed on a different survey date.

*CAGN detected during unrelated survey of adjacent property.

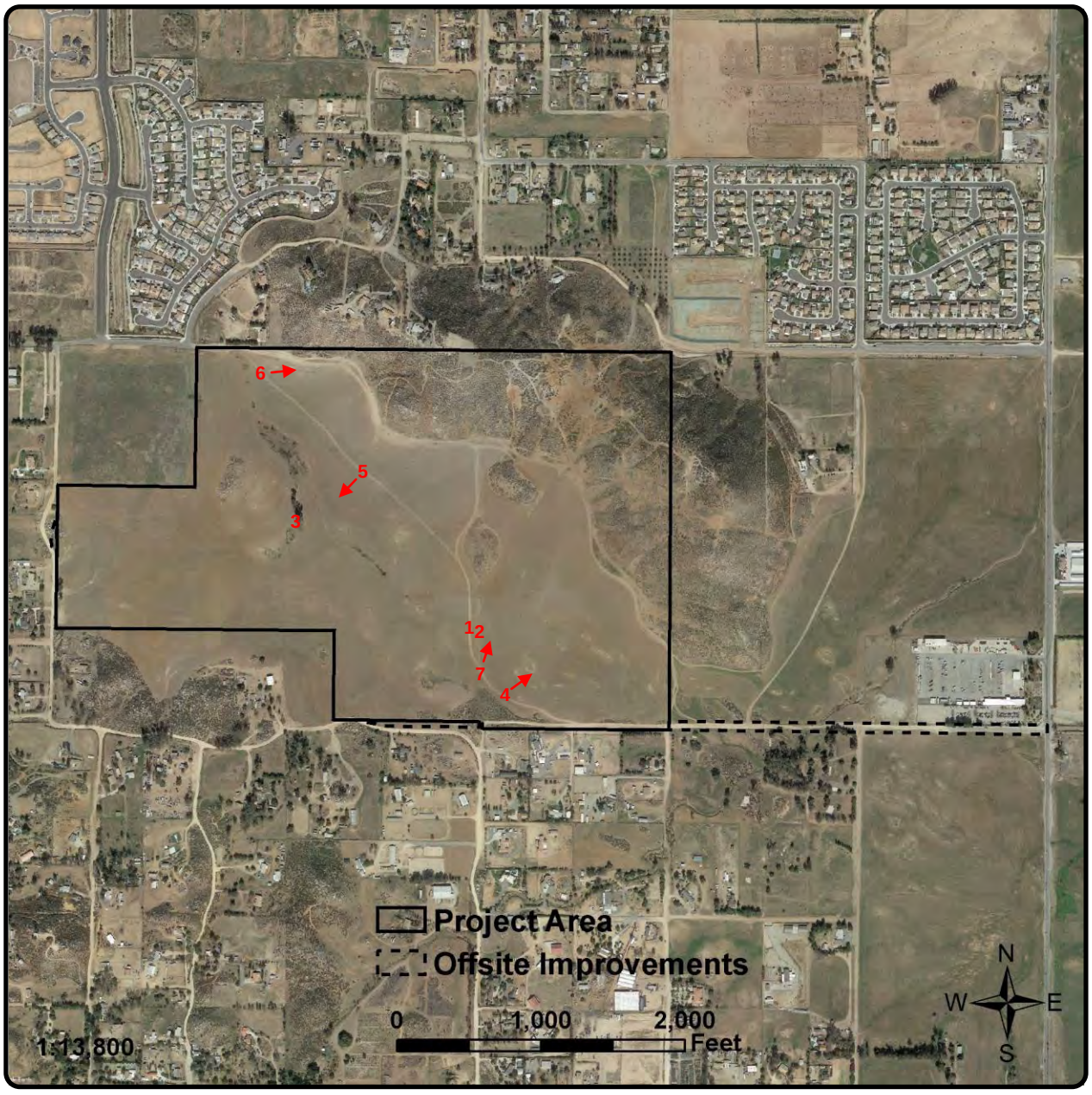
**CAGN was also detected in the same approximate areas on 04.08.17, 04.25.17, and 05.06.17. These are likely the same individuals previously detected in the area.

***BTJA was also detected in the same approximate areas on 04.08.17 and 05.06.17; number of individuals was not determined.

Other species observed during previous surveys are Cooper's hawk (2007), northern harrier (2011, 2013), and Costa's hummingbird (2011); details of these observations are not available.

Details of observations prior to 2011 are not available.

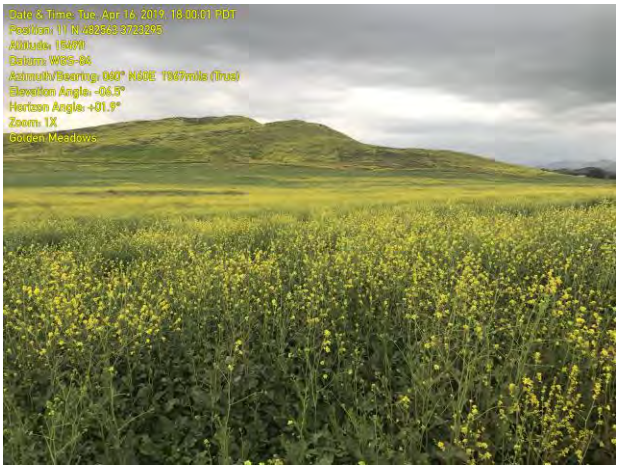
APPENDIX B: Site Photographs



(1) Burrowing owl observed on the site in 2018 (May 30, 2018)

(2) Burrowing owl burrow site (June 14, 2018).

(3) Potential raptor nest (inactive) in eucalyptus tree (June 14, 2018).



(4) Tall, thick growth of mustard and other non-native plants throughout the agricultural fields in 2019 (04.16.2019).

(5) Thick growth of mustard in agricultural fields; eucalyptus tree with inactive raptor nest in background (05.15.2019).

(6) Agricultural fields with buckwheat scrub on slopes in the background (06.23.2019).

(7) Vicinity of 2018 burrow showing thick growth of non-native vegetation in 2019 (06.23.2019).

APPENDIX C: Riverside County Documentation

Certification

Certification: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: July 15, 2019 SIGNED: _____

Leslie Irish, Principal, L&L Environmental, Inc.
909-335-9897

1) Fieldwork Performed By:

Guy Bruyea
Name

2) Fieldwork Performed By:

_____
Name

3) Fieldwork Performed By:

_____
Name

4) Fieldwork Performed By:

_____
Name

5) Fieldwork Performed By:

_____
Name

6) Fieldwork Performed By:

_____
Name

Check here __ if adding any additional names / signatures below or on other side of page.

BIOLOGICAL REPORT SUMMARY SHEET

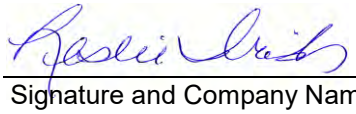
Applicant Name: Richland Communities
Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001
Section, Township and Range: Sections 15 and 16, Township 6 South, Range 3 West
Building and Safety Log Number: _____
Case Number: TR 31194 Lot/Parcel _____ EA Number _____

MARK ITEM(S) SURVEYED FOR	**SPECIES or ENVIRONMENTAL ISSUE of CONCERN**	***(Mark Yes, No, or N/A regarding species findings on the referenced site)***		
		Yes	**No**	**n/a**
	Arroyo Southwestern Toad	Yes	No	n/a
X	Blue-line Stream(s) (previous survey)	Yes	No	n/a
X	Burrowing Owl	Yes	No	n/a
	Coachella Valley Fringed-toed Lizard	Yes	No	n/a
X	Coastal California Gnatcatcher	Yes	No	n/a
X	Coastal Sage Scrub (previous survey)	Yes	No	n/a
	Delhi Sands Flower-loving Fly	Yes	No	n/a
	Desert Pupfish	Yes	No	n/a
	Desert Slender Salamander	Yes	No	n/a
	Desert Tortoise	Yes	No	n/a
	Flat-tailed Horned Lizard	Yes	No	n/a
	Least Bell's Vireo	Yes	No	n/a
X	Oak Woodlands (previous survey)	Yes	No	n/a
X	Quino Checkerspot Butterfly (previous survey)	Yes	No	n/a
	Riverside Fairy Shrimp	Yes	No	n/a
	Santa Ana River Woolystar	Yes	No	n/a
	San Bernardino Kangaroo Rat	Yes	No	n/a
	Slender-horned Spineflower	Yes	No	n/a
	Stephens' Kangaroo Rat	Yes	No	n/a
X	Vernal Pools (previous survey)	Yes	No	n/a
X	Wetlands (previous survey)	Yes	No	n/a

MARK ITEM(S) SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE of CONCERN	*(Mark Yes, No, or N/A regarding species findings on the referenced site)*		
X	Cooper's Hawk (previous surveys)	Yes	No	n/a
X	California Horned Lark	Yes	No	n/a
X	Black-tailed Jackrabbit (previous surveys)	Yes	No	n/a
X	White-tailed Kite (previous surveys)	Yes	No	n/a
X	Coast Horned Lizard (previous surveys)	Yes	No	n/a
X	Long-spined spineflower (previous survey)	Yes	No	n/a
X	Great blue heron (previous survey)	Yes	No	n/a
X	Northern harrier (previous survey)	Yes	No	n/a
X	Costa's hummingbird (previous survey)	Yes	No	n/a
	Other	Yes	No	n/a

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened, or candidate species by either state, or federal regulations, or for Riverside County as listed by the California Department of Fish and Wildlife Natural Diversity Data Base (CNDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report or habitat assessment.



L & L Environmental, Inc.
Signature and Company Name

July 15, 2019
Date

10(a) Permit Number (if applicable)

Permit Expiration Date

County Use Only

Received By: _____ Date: _____

PD-B# _____

Attachment E-4

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit two copies to the County)

Case Number: TR 31194 Lot/Parcel No. _____ EA Number _____

Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001

Date: July 15, 2019

Biological Resources: (Check the level of impact that applies to the following questions.)

Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?

☐ ■ ☐ ☐

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?

☐ ■ ☐ ☐

c) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, or U. S. Wildlife Service?

☐ ■ ☐ ☐

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

☐ ■ ☐ ☐

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit two copies to the County)

e) Have a substantial adverse effect on any riparian habitat, or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife, or the U.S. Fish and Wildlife Service?

☐ ■ ☐ ☐

f) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption)

☐ ■ ☐ ☐

g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

☐ ■ ☐ ☐

Findings of Fact:

No burrowing owl, occupied burrows, or owl sign was identified during 2019 surveys. One (1) burrowing owl and one (1) potentially occupied burrow were observed on the site in 2018. Tall, dense non-native vegetation on the site in 2019 made conditions unsuitable for burrowing owl. If future farming removes this vegetation, habitat may be suitable for burrowing owl again.

Potential nesting bird habitat is present onsite. One (1) inactive potential raptor nest is present onsite.

One (1) special status plant species and nine (9) special status wildlife species have been identified onsite during past and present surveys (long-spined spineflower, coastal California gnatcatcher, Cooper's hawk, white-tailed kite, California horned lark, great blue heron, northern harrier, Costa's hummingbird, black-tailed jackrabbit, and coast horned lizard). Coastal California gnatcatcher and California horned lark were observed in 2019.

A mapped blue-line stream is present onsite and is associated with riparian/riverine vegetation.

Proposed Mitigation:

Avoidance and/or onsite or offsite restoration of riparian habitat is recommended. Preconstruction surveys for burrowing owl and other nesting bird species are recommended prior to disturbance of the site. Annual burrowing owl surveys are advisable until construction starts.

Monitoring Recommended:

None.

Source: CGP Fig. VI.36-VI.40, Revised October 1999

APPENDIX D: CNDDB Forms 2019

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
P.O. Box 944209
Sacramento, CA 94244-2090
CNDDB@wildlife.ca.gov

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 03/11/2019

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Polioptila californica californica*

Common Name: Coastal California gnatcatcher

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: 1 Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? 736 Yes, Occ. # ☐ No ☐ Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Guy Bruyea
Address: 700 East Redlands Blvd, #U351
Redlands, CA 92373
E-mail Address: cwakeman@llenviroinc.com
Phone: 909.335.9897

Plant Information
Phenology:
_____ % vegetative _____ % flowering _____ % fruiting

Animal Information
1 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Riverside Landowner / Mgr: Private
Quad Name: Romoland Elevation: 1557
T___ R___ Sec___, ___¼ of ___¼, Meridian: H( ) M( ) S( ) Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec___, ___¼ of ___¼, Meridian: H( ) M( ) S( ) GPS Make & Model: _____
DATUM: NAD27 ( ) NAD83 ( ) WGS84 (●) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)
Coordinates: 33.655673 117.184620

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent ( ) Good ( ) Fair ( ) Poor
Immediate AND surrounding land use: _____
Visible disturbances: _____
Threats: _____
Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

CDFW/BDB/1747 Rev. 7/3/2018

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
P.O. Box 944209
Sacramento, CA 94244-2090
CNDDB@wildlife.ca.gov

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 04/16/2019

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Polioptila californica californica*

Common Name: Coastal California gnatcatcher

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: 1 Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? 736 Yes, Occ. # ☐ No ☐ Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Guy Bruyea
Address: 700 East Redlands Blvd, #U351
Redlands, CA 92373
E-mail Address: cwakeman@llenviroinc.com
Phone: 909.335.9897

Plant Information
Phenology:
_____ % vegetative _____ % flowering _____ % fruiting

Animal Information
1 # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description *(please attach map AND/OR fill out your choice of coordinates, below)*

County: Riverside Landowner / Mgr: Private
Quad Name: Romoland Elevation: 1629
T___ R___ Sec___, ___¼ of ___¼, Meridian: H( ) M( ) S( ) Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec___, ___¼ of ___¼, Meridian: H( ) M( ) S( ) GPS Make & Model: _____
DATUM: NAD27 ( ) NAD83 ( ) WGS84 (●) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) *OR* Geographic (Latitude & Longitude) (●)
Coordinates: 33.655093 117.189888

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent ( ) Good ( ) Fair ( ) Poor
Immediate AND surrounding land use: _____
Visible disturbances: _____
Threats: _____
Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

CDFW/BDB/1747 Rev. 7/3/2018

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
P.O. Box 944209
Sacramento, CA 94244-2090
CNDDB@wildlife.ca.gov

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 04/16/2019

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Eremophila alpestris actia*

Common Name: California horned lark

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: S Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ No ☐ Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Guy Bruyea
Address: 700 East Redlands Blvd, #U351
Redlands, CA 92373
E-mail Address: cwakeman@llenviroinc.com
Phone: 909.335.9897

Plant Information
Phenology:
_____ % vegetative _____ % flowering _____ % fruiting

Animal Information
_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Riverside Landowner / Mgr: Private
Quad Name: Romoland Elevation: 1557
T___ R___ Sec___, ___¼ of ___¼, Meridian: H○ M○ S○ Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec___, ___¼ of ___¼, Meridian: H○ M○ S○ GPS Make & Model: _____
DATUM: NAD27 ○ NAD83 ○ WGS84 (●) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ○ UTM Zone 11 ○ ***OR*** Geographic (Latitude & Longitude) (●)
Coordinates: 33.650844 117.185067

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Several horned lark observed in this area during surveys on April 16, May 15, May 28, and June 21

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ○ Excellent ○ Good (●) Fair ○ Poor
Immediate AND surrounding land use: Agricultural land
Visible disturbances: _____
Threats: Proposed development
Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☒ Other: identified by experienced field biologist

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ○ yes ○ no

CDFWBDB1747 Rev. 7/3/2018

Mail to:
California Natural Diversity Database
California Dept. of Fish & Wildlife
P.O. Box 944209
Sacramento, CA 94244-2090
CNDDB@wildlife.ca.gov

For Office Use Only
Source Code: _____ Quad Code: _____
Elm Code: _____ Occ No.: _____
EO Index: _____ Map Index: _____

Date of Field Work (mm/dd/yyyy): 05/28/2019

Clear Form

California Native Species Field Survey Form

Print Form

Scientific Name: *Eremophila alpestris actia*

Common Name: California horned lark

Species Found? (●) Yes ( ) No _____ If not found, why?

Total No. Individuals: S Subsequent Visit? (●) Yes ( ) No

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ No ☐ Unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Guy Bruyea
Address: 700 East Redlands Blvd, #U351
Redlands, CA 92373
E-mail Address: cwakeman@llenviroinc.com
Phone: 909.335.9897

Plant Information
Phenology:
_____ % vegetative _____ % flowering _____ % fruiting

Animal Information
_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ lek ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Riverside Landowner / Mgr: Private
Quad Name: Romoland Elevation: 1524
T___ R___ Sec___, ___¼ of ___¼, Meridian: H ( ) M ( ) S ( ) Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec___, ___¼ of ___¼, Meridian: H ( ) M ( ) S ( ) GPS Make & Model: _____
DATUM: NAD27 ( ) NAD83 ( ) WGS84 (●) Horizontal Accuracy: _____ meters/feet
Coordinate System: UTM Zone 10 ( ) UTM Zone 11 ( ) ***OR*** Geographic (Latitude & Longitude) (●)
Coordinates: 33.653331 117.191005

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Several horned lark observed in this area during surveys on May 28 and June 23

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ( ) Excellent ( ) Good (●) Fair ( ) Poor
Immediate AND surrounding land use: Agricultural land
Visible disturbances: _____
Threats: Proposed development
Comments:

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☒ Other: identified by experienced field biologist

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ( ) yes ( ) no

CDFWBDB1747 Rev. 7/3/2018

REVISED FINAL

L&L ENVIRONMENTAL, INC.
REGULATORY SERVICES
BIOLOGICAL & CULTURAL INVESTIGATIONS & MONITORING

UPDATED BIOLOGICAL RESOURCES ASSESSMENT, BOTANICAL, BURROWING OWL, AND NESTING RAPTOR SURVEYS, AND RIPARIAN BIRD HABITAT ASSESSMENT GOLDEN MEADOWS PROJECT, TRACT 31194, CITY OF MENIFEE, CALIFORNIA

±204.65-Acre Property, ±4.68 Acres Offsite, ±209.33 Acres Surveyed

APNs 360-300-002, -003, -004, -005, -006, -009, 360-350-001, and portions of offsite 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -024, 360-360-009, -010, -011, and 360-380-004, Tract 31194, Township 6 South, Range 3 West, Sections 15 and 16, USGS Romoland, 7.5' Topographic Quadrangle

Prepared For:

Brian Hardy
Richland Communities
3161 Michelson Drive, Suite 425
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Report Summary:

The Project site is in the area covered by the MSHCP but is not in the Criteria Area. The site is mainly agricultural land and disturbed/ruderal areas with some coastal scrub, chaparral, and scattered riparian vegetation. One sensitive vegetation community is present, arroyo willow thickets. No listed plant species observed. Two special status plants, long-spined spineflower and southern California black walnut observed. One immature coast live oak and other trees present. Coastal California gnatcatcher present and nesting on the site. White-tailed kite observed foraging but no nesting. No vernal pools or fairy shrimp habitat. Riparian birds considered absent. Several special status wildlife species observed. One burrowing owl and occupied burrow observed in 2018 but not present in 2021. A preconstruction survey is required. Habitat suitable for nesting birds is present and preconstruction clearance survey and avoidance buffers recommended during the nesting season. Site is not within a wildlife corridor. Jurisdictional and MSHCP riparian/riverine areas present. Regulatory permits and a DBESP are required.

Surveys Conducted By: Guy Bruyea and John Konecny

Surveys Conducted: May – November 2021

Report Date: October 2017, updated October 2018, July 2019, November 2021, revised December 2021

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MANAGEMENT SUMMARY

L&L Environmental, Inc. (L&L) conducted biological surveys on Richland Communities' ±204.65-acre Golden Meadows Project site (and associated offsite improvement areas of ±4.68 acres) in the City of Menifee, California. The Project consists of construction of 572 single-family residential lots and associated roads and infrastructure. A blue-line stream runs through the site and the Project includes an Avoidance/Compatible Use Area along the stream that will retain native habitat and natural flows. Open space will also be retained in the northeast corner of the site. An Environmental Impact Report (EIR) for the Project was published in 2006.

L&L has performed biological surveys on this property since 2003. The purpose of this study was to examine the site to determine presence/absence of biological resources on the property and potential for special status species to occur, as well as update previous survey results. Surveys in 2021 included a biological resources assessment/habitat assessment, focused botanical survey, protocol breeding season burrowing owl survey, nesting raptor survey, and riparian bird habitat assessment. This study reflects the most current field conditions and, where appropriate, makes comparative statements regarding past observed conditions.

The site is within the area covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP requires habitat assessments, and focused surveys if suitable habitat is present, for riparian/riverine resources and associated species and burrowing owl (*Athene cunicularia*). There is one area of Public/Quasi-Public (PQP) Conserved Lands approximately 0.68 miles north-northeast of the site, identified as the Ringing Rock Archaeological Site. Other than the Ringing Rock Site, there are no PQP or MSHCP Conserved Lands within a mile of the site. The site is not within or near any MSHCP Core Areas or Linkages.

The site consists mainly of cultivated agricultural fields (dry-farmed wheat) and disturbed/ruderal areas with some areas of disturbed to relatively undisturbed California buckwheat scrub and chamise chaparral. The ephemeral blue-line stream runs through the agricultural fields and includes scattered and degraded riparian vegetation (arroyo willow thickets and mulefat thickets). Arroyo willow thicket is a sensitive vegetation community. No vernal pools or ponding areas were observed.

Land use adjacent to the site includes anthropogenic disturbances such as rural residential development, agricultural areas, unimproved roads, powerline easements, off-highway vehicle (OHV) activity, and trash dumping.

No state or federally listed threatened or endangered plant species were observed on the site. Two (2) special status plant species were observed, southern California black walnut (*Juglans californica*) and long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*). Five (5) black walnut trees are present within the riparian area on the site. Two long-spined spineflower plants were present in 2017 but the species has not been observed during subsequent surveys. Both of these species are covered under the MSHCP and considered adequately conserved. No other special status plants were observed onsite during previous or current surveys, but three (3) species have a low to moderate or moderate potential to occur: smooth tarplant (*Centromadia pungens ssp. laevis*), Parry's spineflower (*Chorizanthe parryi var. parryi*), and small-flowered morning-glory (*Convolvulus simulans*). All of these species are covered under the MSHCP and considered adequately conserved.

There is a single immature coast live oak tree and a number of other native and non-native trees on the site, mainly in the riparian area. The City may regulate removal or replacement of trees and a tree survey may be required.

Previous and current surveys have documented coastal California gnatcatchers (*Polioptila californica californica*) present on the Project site and nesting has been observed. This species is federally listed as threatened. All observations were in the California buckwheat scrub habitat in the northeastern portion of the site. Coastal California gnatcatcher is a covered species under the MSHCP and considered adequately conserved. Under the MSHCP, focused surveys for this species are not required.

Two white-tailed kites (*Elanus leucurus*) were observed on the Project site in 2005 and one in 2011, but this species has not been observed on the site during more recent surveys. This species is fully protected in California. The EIR includes a mitigation measure (4.3-5) requiring a nesting raptor survey prior to issuance of grading permits and a CDFW Incidental Take Permit (2080 permit) if white-tailed kite are documented as nesting on the Project site. The California Natural Diversity Database (CNDDB) has documented occurrences of five (5) white-tailed kite nests within 10 miles of the Project site but no white-tailed kite nesting has been observed onsite. White-tailed kite is a covered species under the MSHCP and considered adequately conserved.

No vernal pools, ponding areas, or potential habitat for fairy shrimp were observed. The riparian vegetation on the site is scattered and degraded and there is no suitable habitat for least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), or western yellow-billed cuckoo (*Coccyzus americanus occidentalis*).

Two other listed species have a moderate or high potential to occur on the Project site, although they have not been observed: Stephens' kangaroo rat (*Dipodomys stephensii*) and tricolored blackbird (foraging) (*Agelaius tricolor*). Both of these species are covered under the MSHCP and considered adequately conserved. Under the MSHCP, focused trapping surveys for Stephens' kangaroo rat are not required.

Habitat suitable for use by burrowing owl is present on much of the property but is regularly disturbed by agricultural activities. There were no observations of burrowing owls during biological surveys of the site in 2003, 2004, 2005, 2006, 2011, 2013, and 2017. Surveys in 2018 observed one burrowing owl and an active burrow. The owl was observed during the survey on May 30, 2018 but was not observed during subsequent surveys. Focused surveys in 2019 and 2021 did not detect any burrowing owl, occupied burrows, or owl sign. A preconstruction clearance survey for burrowing owl (valid for 30 days) will be required.

Other special status wildlife species have observed on the site during previous and current surveys: coast horned lizard (*Phrynosoma blainvillii*), orange-throated whiptail (*Aspidoscelis hyperythra*), coastal (western) whiptail (*Aspidoscelis tigris stejnegeri*), Cooper's hawk (*Accipiter cooperii*), northern harrier (*Circus hudsonius*), California horned lark (*Eremophila alpestris actia*), great egret (*Ardea alba*), great blue heron (fly over) (*Ardea herodias*), Lawrence's goldfinch (*Spinus lawrencei*), loggerhead shrike (*Lanius ludovicianus*), California thrasher (*Toxostoma redivivum*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), Bell's sage sparrow (*Artemisiospiza belli belli*), Nuttall's woodpecker (*Dryobates nuttallii*), wrentit (*Chamaea fasciata*), Costa's hummingbird (*Calypte costae*), rufous hummingbird (*Selasphorus rufus*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*).

All of these species are covered under the MSHCP and considered adequately conserved except great egret, Lawrence's goldfinch, California thrasher, Nuttall's woodpecker, wrentit, Costa's hummingbird, and rufous hummingbird, which are not covered under the MSHCP.

Five (5) additional special status wildlife species have not been observed on the Project site during surveys but have a low to moderate potential to occur: Crotch bumble bee (*Bombus*

crotchii), southern California legless lizard (*Anniella stebbinsi*), Dulzura pocket mouse (*Chaetodipus californicus femoralis*), northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), and western mastiff bat (foraging) (*Eumops perotis californicus*). Northwestern San Diego pocket mouse is covered under the MSHCP and considered adequately conserved. The remaining four species are not covered under the MSHCP. Crotch bumble bee was previously a candidate for state listing, but its status is currently in litigation. If this species becomes listed, focused surveys and incidental take permitting may be required.

Nesting birds are protected under State and federal laws and habitat suitable for nesting birds (including raptors) is present within and around the site. Scheduling Project activities outside the nesting season (generally January 1 through September 15) or conducting preconstruction nesting bird clearance surveys and establishing avoidance buffers around any active nests is recommended. If nesting birds are present, an avoidance buffer of 300 to 500 feet (or as recommended by a biologist) should be established around active nests until juvenile birds have fledged and/or a biologist has verified that the nest has become inactive.

The Project site is largely surrounded by scattered existing development and there is no connectivity between the site and conserved lands to the east (Diamond Valley Lake) and southwest (Santa Rosa Plateau, Cleveland National Forest). Although there may be limited local movement of wildlife across the site, it is not within or adjacent to a wildlife corridor.

An ephemeral blue-line stream is present on the site and includes state waters and wetlands, federal waters, and MSHCP riparian/riverine habitat. All jurisdictional areas onsite will either be impacted by development or incorporated into the Avoidance/Compatible Use Area. The Avoidance/Compatible Use Area will retain native riparian habitat and natural flows. Regulatory permits from the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) will be required for impacts to jurisdictional areas. A Determination of Biologically Equivalent or Superior Preservation (DBESP) will be required for impacts to MSHCP riparian/riverine habitat.

Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys.

1.0) INTRODUCTION

This report was prepared by L&L Environmental, Inc. (L&L) for Richland Communities. It describes the results of biological surveys conducted on a proposed residential development site located within the City of Menifee, Riverside County, California. The Project site consists of Assessor's Parcel Numbers (APNs) 360-300-002, -003, -004, -005, -006, -009, and 360-350-001 (totaling ±204.65 acres) and portions of APNs 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -024, 360-360-009, -010, -011, and 360-380-004 where offsite improvements are planned (totaling ±4.68 acres).

The 2021 updated assessment consisted of (1) a records search and literature review, conducted to determine the species of concern in the Project area and proximity to closest documented special status species observations, (2) field surveys to identify plants and wildlife on the site and assess presence/absence of habitat for species of concern, (3) a focused botanical survey, (4) a protocol breeding season survey for burrowing owl, and (4) a habitat assessment for riparian birds.

1.1) Project Description

The Project is identified as Golden Meadows (formerly known as Menifee Assemblage), Tract No. 31194, and consists of construction of 572 single-family residential lots and associated roads and infrastructure (Figure 3b). The Project will be constructed in four (4) phases. Offsite impacts include improvements to existing roads and installation of flood control structures. The site plan is provided in Appendix E. An Environmental Impact Report for the Project was published in 2006 (T&B 2006).

The property also includes an Eastern Municipal Water District (EMWD) tank site. The proposed tank site includes two large water tanks and an access road. The tanks will serve multiple developments, including Golden Meadows. The tank site is located within the tract boundary, but it is not within the proposed Project boundary and is not a part of the Project.

The Project includes an Avoidance/Compatible Use Area along the blue-line stream that retains native habitat and natural flows. Open space will also be retained in the northeast corner of the site.

1.2) Location

The site is located in Paloma Valley, west of the Interstate 215 freeway (I-215), south of Newport Road, and east of Murrieta Road (Figure 1). It is located between Wickerd Road to the south and Garbani Road to the north. The site is situated in Sections 15 and 16, Township 6 South, Range 3 West, within the USGS *Romoland* 7.5' series quadrangle map (Figure 2).

The site is generally bounded as follows: to the west by agricultural lands, Evans Road (unimproved), rural residential areas, and a school; to the east by a mixture of disturbed and relatively undisturbed vacant land, Sherman Road (unimproved), and a Frontier Communications building complex and Haun Road beyond; to the north by a mixture of disturbed and relatively undisturbed vacant lands, rural residential areas, Garbani Road (unimproved), and residential developments; and to the south by Wickerd Road (unimproved), and a mix of disturbed and relatively undisturbed vacant lands and rural residential areas (Figure 3a).

L&L Environmental, Inc.

BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

RLCC-03-187
December 2021

Figure 1

Project Vicinity Map

Golden Meadows, TT 31194
City of Menifee, California

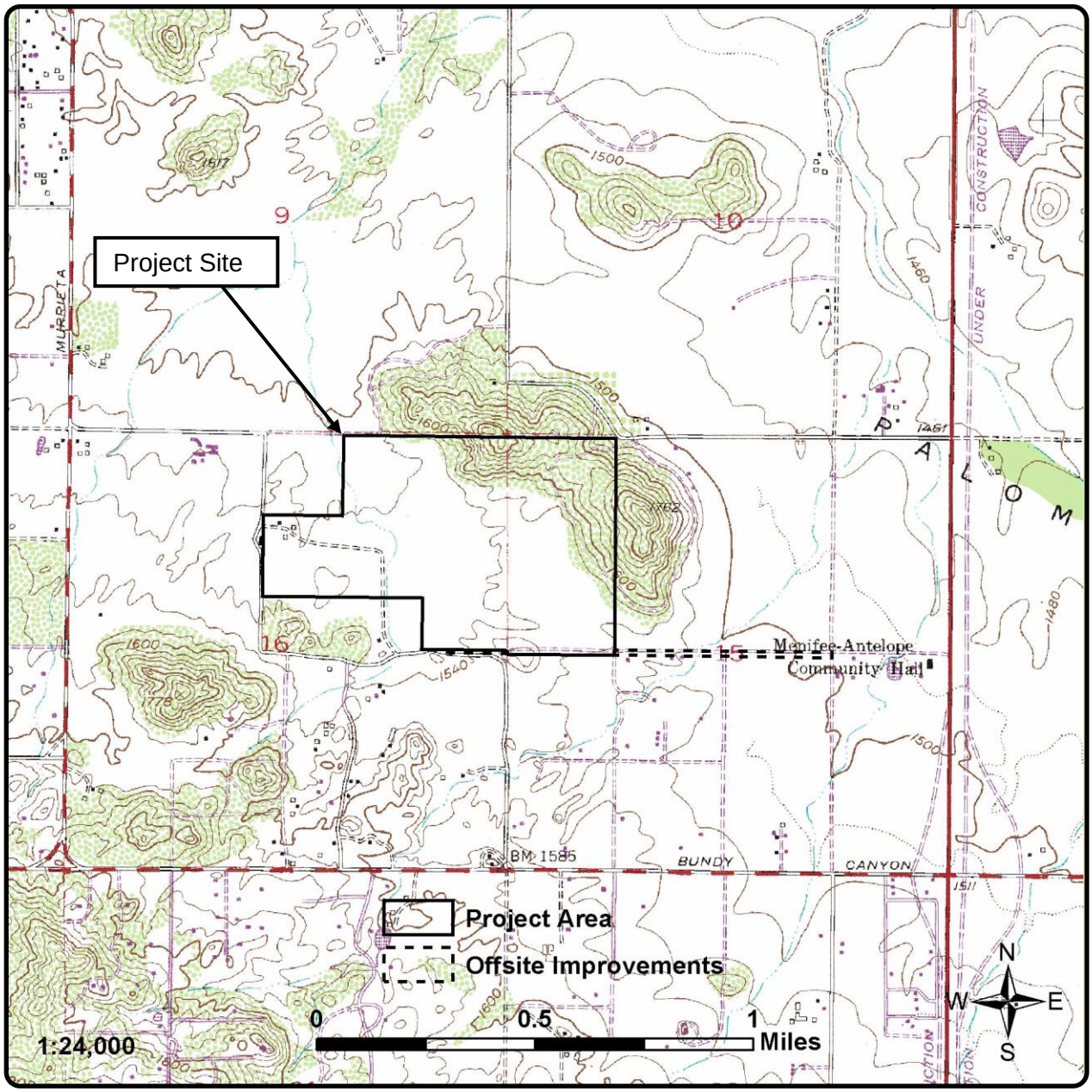

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Figure 2

Project Location Map
(USGS Romoland 1979 quadrangle,
Sections 15 & 16, Township 6 South, Range 3 West)

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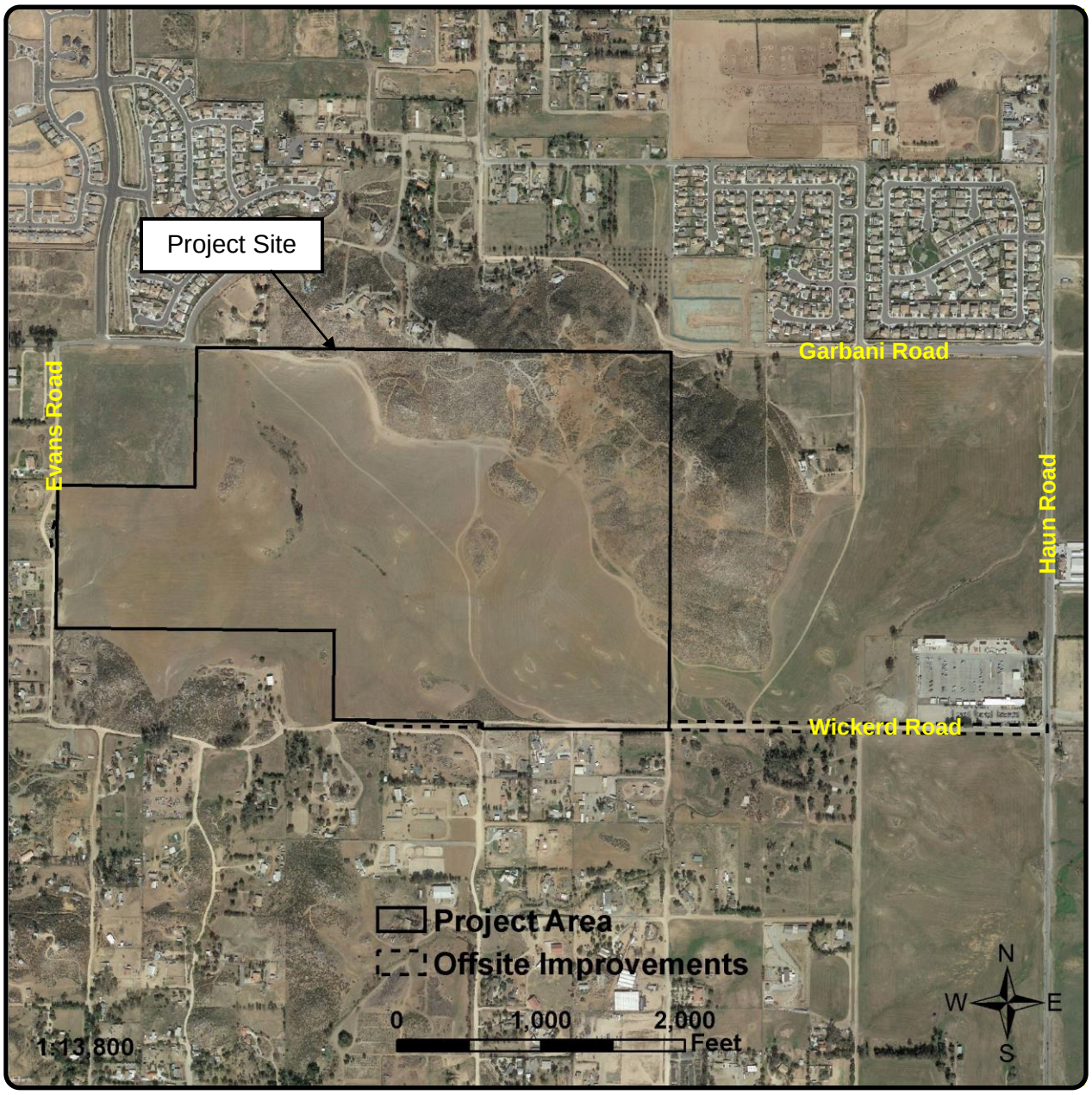

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Figure 3a

Aerial Photograph
(Photo obtained from Google Earth, February 2018)

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Figure 3b

Development Plan
(Plan obtained from Hunsaker & Assoc. Irvine, Inc., 2021)

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1.3) Vegetation and Setting

A review of historical aerial images (NETRonline 2021, Google Earth 2021) finds that most areas of the site have been disturbed in association with agricultural uses since at least 1938. These areas are still under cultivation and do not support native habitat communities. Areas of California buckwheat scrub are present in the less disturbed areas on the property, mainly the slopes in the northeastern corner. Remnants of chamise chaparral are present along the southern site boundary.

An ephemeral drainage feature and mapped blue-line stream is present trending from the southwest/central to the northwest portion of the site, as well as various other jurisdictional features. Much of this area has been impacted by agricultural activities and invasive plants, but limited areas of disturbed and degraded riparian vegetation are present in association with this drainage. No vernal pools or ponding areas were observed onsite.

Land use adjacent to the site includes anthropogenic disturbances such as rural residential development, agricultural areas, unimproved roads, powerline easements, OHV activity, and trash dumping.

Two (2) unimproved roads are present on the property. The first is an unnamed dirt road that begins at the eastern terminus of Daniel Road (in the northwestern corner of the site) and exits at the southeastern corner of the site near the intersection of Wickerd Road and Ascot Way. The second is identified as Krubsack Road, which runs north-south through agricultural fields within the roughly west-central portion of the property and connects with Wickerd Road to the south and Daniel Road to the north. Many OHV trails are also present on the property, mainly in the northeastern corner. The 2021 survey found that earthen berms and rock piles had recently been placed on roads and trails to block entrance to the site.

1.4) Soils and Topography

Soils on the Project site were mapped as Wyman loam (WyC2), Vallecitos loam (VeC2), Porterville clay (PsC), Yokohl loam (YbC and YbE3), Cajalco fine sandy loam (CaC2 and CaD2), Cajalco rocky fine sandy loam (CbF2), Honcut sandy loam (HnC and HnD2), Las Posas loam (LaD2), and Las Posas rocky loam (LkD2 and LkF3) (NRCS 2021) (Figure 4).

The most common soils mapped for the subject property are Wyman loam on the central and western portion of the site (in agricultural areas) and Las Posas rocky loams on vegetated

hillsides within the northern and eastern portions of the site. Clay soils are relatively uncommon on the site, but Porterville clay is mapped as present near the southeastern portion of the property. Soils observed onsite range from mostly sandy-loamy within the agricultural areas to rocky loamy on the vegetated hillsides. Cryptobiotic crusts are present, but only within less disturbed portions of the site.

Topographically, much of the site is relatively flat and contains open land with low-relief rocky outcrops. Gently to steeply sloping hills and ridgelines are present within the northeastern portion of the property. The site has a combined maximum vertical relief of roughly 220 feet (67 meters) between the highest and lowest points on the property, with elevation ranging from approximately 1,500 to 1,720 feet (457 to 524 meters) above mean sea level (AMSL).

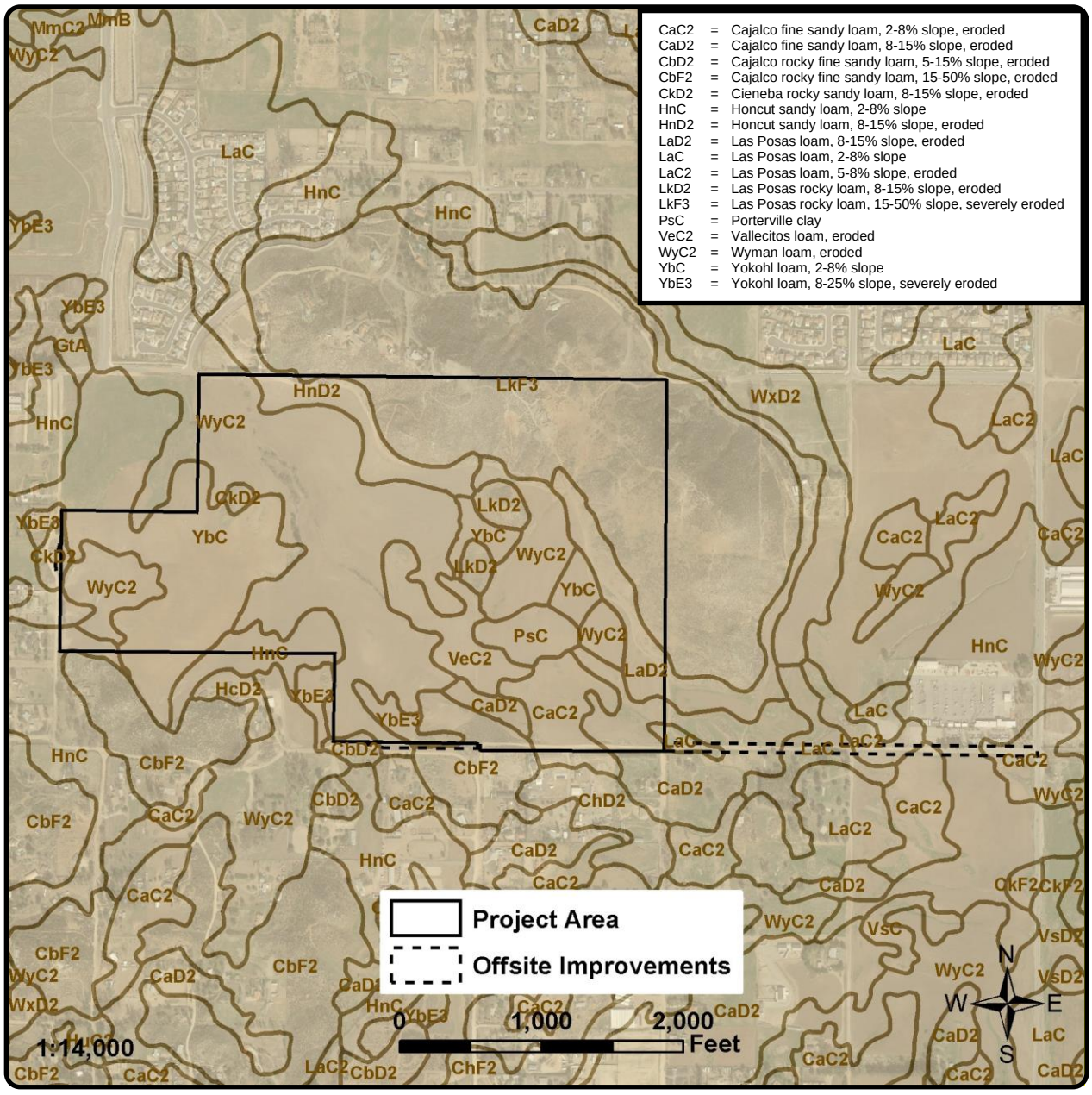

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Figure 4

Soils Map

(Photo obtained from Google Earth, February 2016, USDA Nat. Res. Cons. Serv. SSURGO Data)

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2.0) METHODS AND PERSONNEL

2.1) Literature Review

Certain plants and animals have been listed as threatened or endangered under state or federal Endangered Species Acts. Other species have not been formally listed, but declining populations or habitat availability are reasons for concern regarding their long-term viability. These species are included in lists compiled by resource management agencies or conservation organizations. In this report, the term "listed" refers to all species that are listed, or candidates for listing, as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or California Department of Fish and Wildlife (CDFW). "Special status species" refers to all species included in one or more compendia of rare species, but not listed as threatened or endangered by USFWS or CDFW.

Pertinent literature was reviewed to identify local occurrences and habitat requirements of special status species and communities occurring in the region. Literature reviewed included compendia provided by resource agencies (CDFW 2021a, 2021b), a search of the California Natural Diversity Database (CNDDB; CDFW 2021c) and California Native Plant Society Inventory of Rare and Endangered Plants (CNPS 2021) for the Project topographic quadrangle (Romoland) and adjacent quadrangles (Steele Peak, Perris, Lakeview, Lake Elsinore, Winchester, Wildomar, Murrieta, and Bachelor Mountain), and a search of USFWS Information for Planning and Consultation (IPaC; USFWS 2021a) for the Project site. Reports of previous surveys completed for the site (L&L 2003-2019) were also reviewed. Information from past surveys is summarized and included in this report as appropriate.

Potentials for occurrence of plant and wildlife species were evaluated and classified as either absent, not expected, low, moderate, high, or occurs. These classifications are based on the presence and quality of habitat, geographic and elevation range of species, proximity to a known occurrence of a species obtained from CNDDB or other reliable data, and field observations. Classifications for individual species may be modified based on biologists' experience and expert opinion.

Scientific names of plants follow Baldwin et al. (2012) with updates from the online Jepson eFlora (Jepson 2021). Scientific names of animals follow Stebbins (1985), Jameson and Peeters (1988), Cornell (2021), and Arnett (2000), with updates from academic sources. Current conservation status of plant and wildlife species determined from CDFW (2021a,

2021b). Vegetation community classifications follow Sawyer et al. (2009) with updates from CDFW (2020). State ranks (S ranks) for vegetation communities are from CDFW (2020). Other sources consulted for information regarding biological resources include Brown (1994), Recon (1985), Schoenherr (1990), and Small (1994).

In this report, the "Project site" or "site" includes all of the Project parcels (±204.65 acres) plus offsite impact areas (±4.68 acres) for a total of ±209.33 acres surveyed. Acreages are based on GIS calculations.

2.2) General Biological and Botanical Survey Methods

L&L biologist Guy Bruyea visited the Project site from May through November of 2021 to conduct general biological and botanical surveys (Table 1).

Table 1. General Biological and Botanical Survey Dates and Weather Conditions

Date	Time	Weather	Wind (mph)
05.21.2021	0545-0845	Clear, 50-56º F	1-6
05.21.2021	1700-1930	Clear, 62-67º F	2-5
05.25.2021	0530-0830	Clear, 57-65º F	0-1
05.31.2021	0530-0830	Marine layer/Clear, 61-73º F	0-4
05.31.2021	1700-1930	Clear, 74-82º F	2-4
06.05.2021	0600-1100	Clear, 74-83º F	0-2
06.07.2021	0600-1000	Clear, 58-67º F	0-3
07.06.2021	0600-0900	Clear, 66-75º F	0-2
07.11.2021	0600-0830	Partly Cloudy, 73-81º F	1-2
08.01.2021	0630-1030	Clear, 76-87º F	1-4
11.08.2021	0800-1200	Clear, 66-75º F	0-3
11.09.2021	0900-1300	Clear, 70-79º F	1-5

A total of about 40.5 person-hours were spent onsite during surveys in 2021. All habitat types onsite were visited on foot. The site was surveyed by conducting a series of transects across the subject property where possible, stopping periodically for observations and notations. A general habitat map and field notes were completed at the time of the survey. All field surveys were conducted during daylight hours. Digital photographs were taken to record the condition of the site during the present survey.

The methodology used is consistent with recommendations by the California Native Plant Society (CNPS 2001), CDFW (2018, 2000), and USFWS (2000). All plant species observed were identified in the field or collected for later identification or confirmation. All species were recorded in field notes and the locations of special status species were documented using GPS. Plants of uncertain identity were collected and subsequently identified from keys, descriptions,

and illustrations in Baldwin (2012), Abrams (1923, 1944, and 1951), Abrams and Ferris (1960), Munz (1974), and Parker (1999).

Vegetation community mapping of the site was also verified in 2021. The vegetation mapping from the 2018 biological survey report (L&L 2018a) was used as a basis and verified through field observations. Vegetation community classification is consistent with the California Natural Community List (CDFW 2020) and Sawyer et al. (2009).

2.3) Burrowing Owl Survey Methods

Protocol breeding season burrowing owl surveys were conducted by Mr. Bruyea concurrently with a portion of the general biological and botanical surveys (Table 2).

Table 2. Burrowing Owl Survey Dates and Weather Conditions

Date	Time	Sunrise*	Sunset*	Weather	Wind (mph)
05.21.2021	0545-0845	0547	--	Clear, 50-56º F	1-6
05.21.2021	1700-1930	--	1952	Clear, 62-67º F	2-5
05.31.2021	0530-0830	0542	--	Marine layer/Clear, 61-73º F	0-4
05.31.2021	1700-1930	--	1958	Clear, 74-82º F	2-4
06.05.2021	0600-1100	0541	--	Clear, 74-83º F	0-2
06.07.2021	0600-1000	0541	--	Clear, 58-67º F	0-3
07.06.2021	0600-0900	0547	--	Clear, 66-75º F	0-2
07.11.2021	0600-0830	0550	--	Partly Cloudy, 73-81º F	1-2

*sunrise/sunset times from timeanddate.com

A total of about 25.5 person-hours were spent during burrowing owl surveys in 2021. The site was examined for suitable burrow sites and for signs of occupation by burrowing owl, including pellets, feathers, whitewash, prey remains, and eggshell fragments, as well as individual owls. A search for potentially suitable burrows within dirt, wood, and rock debris piles, artificially created berms, and other locations was conducted during the surveys. The surveys were concentrated in areas typically associated with burrowing owl habitat, including open areas onsite and areas where California ground squirrel activity (i.e., suitable burrows) was expected. An additional 150-meter (500-foot) buffer area surrounding the site was visually inspected, where possible, in areas identified as potential burrowing owl habitat (Figure 5). Any developed areas were visually surveyed with binoculars due to trespassing concerns on private property.

Transects were walked throughout the property where suitable habitat is present. Coupled with binocular surveys of any restricted areas, this allowed for complete visual ground coverage of the survey area. Distance between transects was approximately 15 to 20 meters.

Per MSHCP protocol for burrowing owl surveys (RCA 2006), surveys should be conducted during weather that is conducive to observing owls outside their burrows and detecting burrowing owl sign. Surveys will not be accepted if they are conducted during rain, high winds (>20 mph), dense fog, or temperatures over 90°F. Surveys should be conducted in the morning one hour before sunrise to two hours after sunrise or in the early evening two (2) hours before sunset to one (1) hour after sunset. Surveys were conducted during appropriate hours and weather conditions (Table 2).

2.4) Nesting Raptor Survey Methods

Concurrently with the burrowing owl survey, the site was examined to determine the presence/absence of nesting raptors on the property, in particular white-tailed kite. This survey primarily focused on examining trees onsite and within 500 feet of the Project site for evidence of raptor nesting.

2.5) Riparian Bird Habitat Assessment Methods

A habitat assessment for riparian bird species least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo was conducted by John Konecny of Konecny Biological Services. Mr. Konecny holds USFWS Section 10(a) permit TE837308-7 for southwestern willow flycatcher.

The habitat assessment was conducted on September 29, 2021 and focused on the riparian vegetation on the site. Weather conditions during the survey were mild with little wind and scattered overcast. No call prompting of any species was conducted.

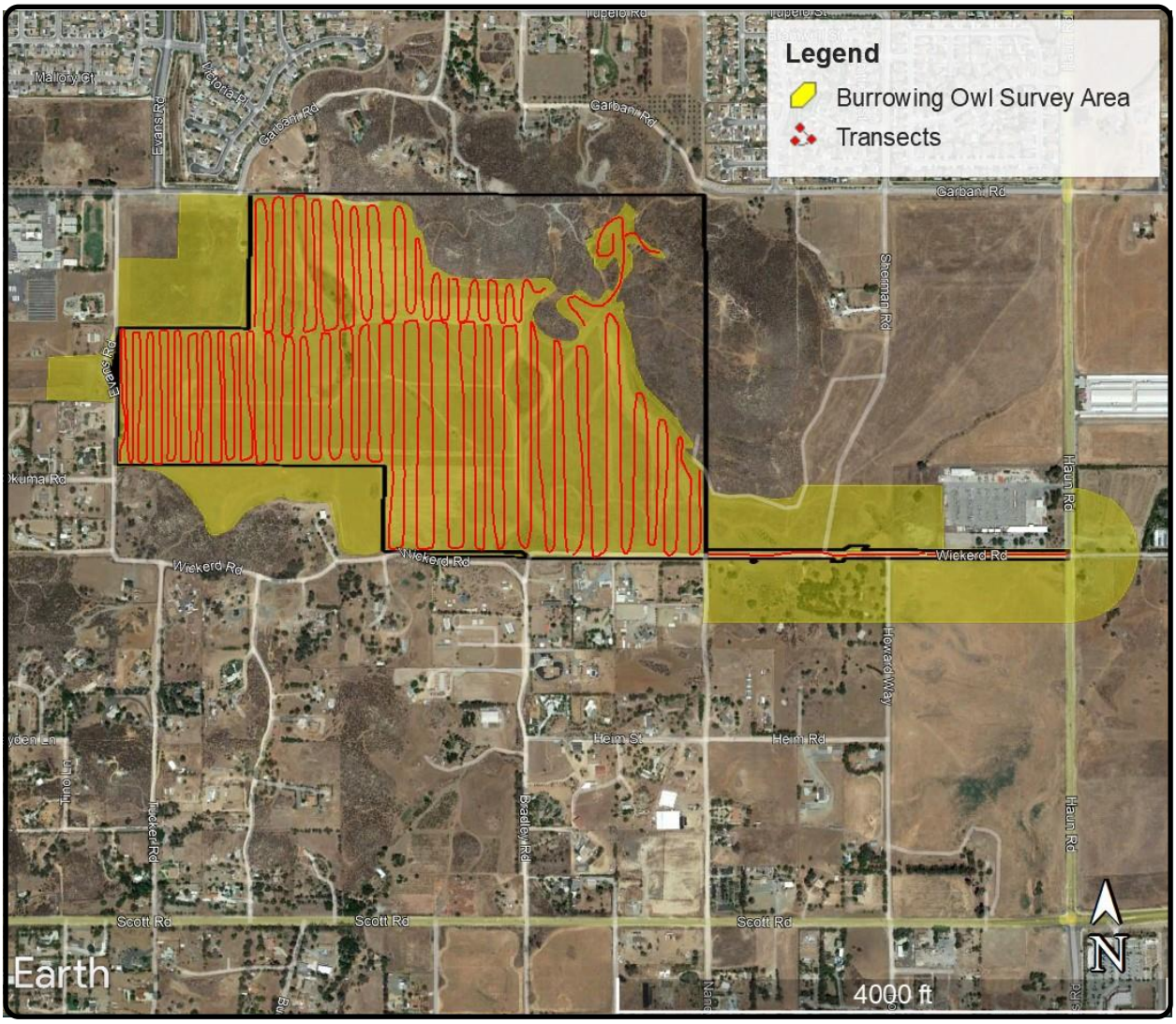

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Figure 5

Burrowing Owl Survey Area
(Photo obtained from Google Earth, August 2021)

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3.0) RESULTS

3.1) Literature Review Results

3.1.1) MSHCP Requirements

The site is located within the area covered by the MSHCP but is not within the Criteria Area. There is one area of Public/Quasi-Public (PQP) Conserved Lands approximately 0.68 miles north-northeast of the site. This PQP area is identified as Ringing Rock Archaeological Site under the management of the Riverside County Parks and Open Space District. Other than the Ringing Rock Site, there are no other PQP or MSHCP Conserved Lands within a mile of the site. The site is not within or near any MSHCP Core Areas or Linkages (Figure 6).

Surveys required by the MSHCP are a habitat assessment to address riparian/riverine and vernal pool habitats and associated species and burrowing owl (RCA 2021). If suitable habitat is present, focused surveys are required.

The MSHCP mapped vegetation layer (1994 baseline) depicts the site as largely agricultural land with areas of coastal sage scrub, grassland, and chaparral. No riparian habitat or Riversidean alluvial fan sage scrub is mapped on the parcel in the 1994 baseline (RCA 2021).

3.1.2) Precipitation

Precipitation data was obtained from the Clark, Sage, and Cranston Remote Automated Weather Stations (RAWS) (WRCC 2021). The Clark RAWS is located about 16.8 miles north-northwest of the Project site at an elevation of 1,720 feet; Sage RAWS is about 14.7 miles east-southeast of the site at an elevation of 1,516 feet; Cranston RAWS is about 21.0 miles east-northeast of the site at an elevation of 1,950 feet (WRCC 2021).

Total precipitation recorded by the Clark, Sage, and Cranston RAWS for the 2021 water year[1] was 4.96, 6.19, and 6.75 inches, respectively. Average annual precipitation for the Project area is 10 to 15 inches (WRCC 2018). Precipitation data is provided in Appendix C.

[1] A water year is October through September. For example, the 2021 water year is October 2020 through September 2021.

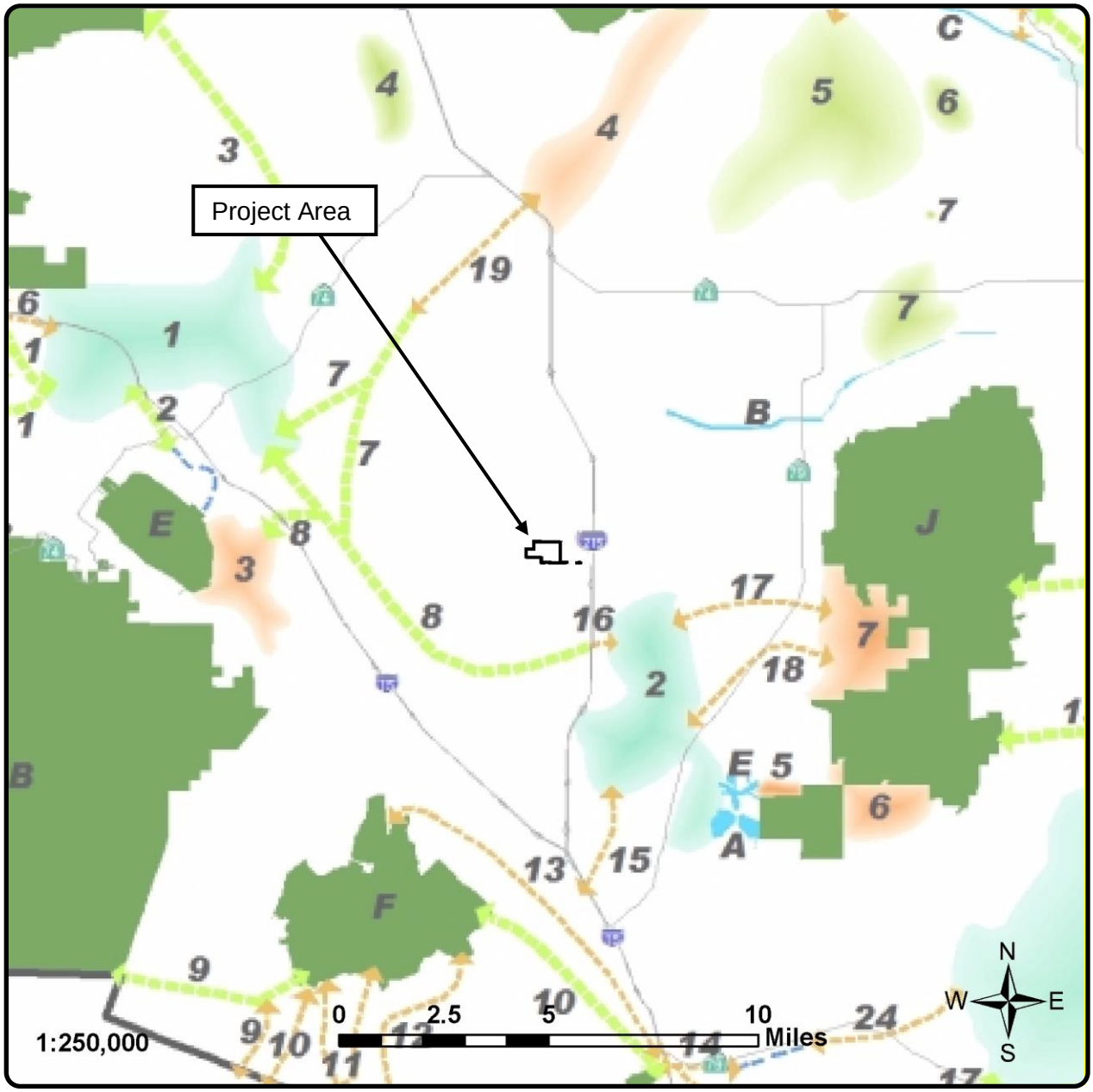

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Figure 6

MSHCP Cores and Linkages
(Riverside County MSHCP)

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3.1.3) Previous Surveys

L&L reviewed the results of previous biological surveys of the site, which included a general biological survey and a jurisdictional delineation in 2003 (L&L 2003a, 2003b), spring botanical survey and focused surveys for Quino checkerspot butterfly and coastal California gnatcatcher in 2004 (L&L 2004a, 2004b, 2004c), burrowing owl survey, habitat assessment for riparian birds, and updated jurisdictional delineation in 2005 (L&L 2005a, 2005b, 2005c), burrowing owl survey, focused surveys for least Bell's vireo and southwestern willow flycatcher, and a habitat assessment for yellow-billed cuckoo in 2006 (L&L 2006a, 2006b), burrowing owl survey in 2007 (L&L 2007), surveys for special status plants, burrowing owl, and updated jurisdictional delineation in 2011 (L&L 2011), habitat assessment and burrowing owl survey in 2013 (L&L 2013), general biological and botanical survey in 2017 (L&L 2017), burrowing owl and nesting raptor surveys and updated jurisdictional delineation in 2018 (L&L 2018a, 2018b), and burrowing owl surveys and an updated jurisdictional delineation in 2019 (L&L 2019a, 2019b). Previous survey results are summarized and incorporated into this report as appropriate.

3.1.4) 2006 Environmental Impact Report

The 2006 Final Environmental Impact Report (EIR) for the Project (T&B 2006) includes the following mitigation measures for impacts to biological resources:

> 4.3-1 TTM No. 31194, Lot #503 (approximately 39.0 acres in the northeastern portion of the property) shall be preserved as open space and shall be covered by a conservation easement or other mechanism to ensure permanent preservation, with allowance for required maintenance of fuel modification zones. The conservation easement area shall be shown on the Final Map.
>
> 4.3-2 Thirty days prior to grading, a qualified biologist shall make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report to be reviewed and accepted by the County of Riverside. If the species is determined to be present, and the MSHCP's stated objectives 1 – 4 for burrowing owl have not yet been met, mitigation shall be required in compliance with the MSHCP, Appendix E which states:
>
> > a. If the site contains or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and surrounding area supports

less than 3 pairs of burrowing owls, then the on-site burrowing owls shall be passively or actively relocated following accepted protocols.

b. If the site (including adjacent areas) supports 3 or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs shall be conserved on-site.

4.3-3 Prior to issuance of grading permits, the applicant shall be required to pay Local Development Mitigation Fees (per County Ordinance No. 4.62.070) for implementation of the MSHCP.

4.3-4 Prior to issuance of grading permits, the applicant shall pay fees in accordance with the USFWS-approved HCP, to mitigate the project's potentially significant impacts to the Stephens' kangaroo rat.

4.3-5 If construction activities occur between February 1 and August 31 and within 150 feet of suitable nesting locations, a focused raptor survey will be required prior to issuance of grading permits. If active nests are located within the portion of the site to be disturbed or within 150 feet of the area to be disturbed, measures shall be initiated to avoid any impacts to nesting raptors. Measures to avoid impacts will include identifying the location and creating a buffer zone around the tree within which impacts will be avoided until the juveniles have fledged.

a. The white-tailed kite is "fully-protected" by the California Department of Fish and Game. If this species is documented as nesting on the project site during the raptor survey, or it is determined this species will be significantly impacted by development a 2080 permit for "take" shall be required from the CDFG.

4.3-6 Prior to the issuance of grading permits, the applicant shall submit documentation to the County of Riverside verifying that the necessary permits required by the U.S. Army Corps of Engineers (ACOE), California Department of Fish and Game (CDFG) and Regional Water Quality Control Board (RWQCB) have been obtained. The ACOE has a no net loss policy which requires that any unavoidable impacts to wetland values and functions be replaced. In addition, the RWQCB will add restrictions to control runoff from the site, require on the site treatment of runoff to improve water quality, and impose Best Management Practices on the construction. It is anticipated that the following measures

or similar measures as approved by the ACOE, CDFG, and RWQCB would reduce impacts to ACOE and CDFG jurisdictional areas to a level less than significant:

a. On or off-site replacement of ACOE jurisdictional waters and wetlands at a ratio no less than 1:1;

b. On or off-site replacement of CDFG jurisdictional streambed and associated riparian habitat at a ratio no less than 1:1; and/or

c. Incorporation of design features into the proposed project that will avoid biological impacts to off-site blue-line streams that ultimately end up in the Railroad Canyon Reservoir (Canyon Lake).

4.3-7 Individual lot fencing shall be used to restrict access to the on-site wetland areas. Back yard gates from individual residential lots that open onto the wetland area shall be prohibited. Fencing locations and materials shall be shown on the Final Map and approved by the County's Environmental Programs Department (EPD) prior to issuance of building permits. Required fencing shall be installed prior to issuance of occupancy permits.

4.3-8 Night lighting during and after project construction shall be directed away from onsite wetland areas and, except for safety and other requirements, lighting shall be limited from the boundaries of onsite wetland areas. In the event that lighting in an area adjacent to the wetland area is necessary, a shield shall be incorporated in project designs to ensure ambient lighting in the wetland area is not increased. Lighting plans shall be approved by the County prior to issuance of building permits. Lighting restrictions and the reasons for such restrictions shall be included in the project's CC&Rs.

4.3-9 The landscape plans for the project in areas adjacent or tributary to wetland areas shall not include those species listed in the MSHCP as "Plants That Should Be Avoided Adjacent to The MSHCP Conservation Area." The County of Riverside Planning Department shall review and approve all plant material for the project, prior to issuance of building permits. Information regarding the importance of avoiding the listed plants, even in front and backyard landscaping, shall be included in sales literature distributed to homeowners. The list of restricted plant materials and the reasons for such restrictions shall be listed in the project's CC&Rs.

3.2) Vegetation Communities

Much of the property has been disturbed by current and historical cultivation and past sheep grazing and does not support native habitat. Less disturbed areas are present, primarily in the northeastern portions of the site, with a mixture of disturbed and relatively undisturbed California buckwheat scrub and chamise chaparral. Sparse riparian vegetation and trees are found along the blue-line stream in the northwestern/central portion of the site (Figure 7).

The agricultural fields are dry farmed for wheat. Evidence of widespread sheep grazing was observed throughout all areas of the site in 2013. Hillsides containing California buckwheat scrub along the farmland edges, especially to the north and east, had been severely damaged by sheep grazing. Very few annuals remained (none in some areas) and many of the perennials had been stripped of vegetation and/or trampled. No evidence of current sheep grazing was observed during surveys in 2017, 2018, 2019, and 2021 and regrowth of native annuals and perennials was observed in the buckwheat scrub areas.

Table 3. Vegetation Communities Present

Vegetation Community	**Area Present (acres)**		
	Onsite	**Offsite**	**Total**
California Buckwheat Scrub	41.69	0	41.69
California Buckwheat Scrub/Ruderal	3.18	0	3.18
Chamise Chaparral	2.05	0.18	2.23
Arroyo Willow Thickets and Mulefat Thickets	0.91	0.02	0.93
Agriculture and Disturbed/Ruderal	156.82	4.48	161.30
Total	**204.65**	**4.68**	**209.33**

Table 4. Vegetation Community Impacts

Vegetation Community	**Area Impacted (acres)***		
	Onsite	**Offsite**	**Total**
California Buckwheat Scrub	18.49**	0	18.49**
California Buckwheat Scrub/Ruderal	2.83	0	2.83
Chamise Chaparral	2.05	0.18	2.23
Arroyo Willow Thickets and Mulefat Thickets	0.11	0.02	0.13
Agriculture and Disturbed/Ruderal	152.66	4.48	157.14
Total	**176.14**	**4.68**	**180.82**

*Any discrepancy in totals due to rounding error. **Includes the water tank site. The water tank site is a separate project covered under a separate CEQA process by EMWD and not a part of the Golden Meadows Project.

3.2.1) California Buckwheat Scrub

In previous reports, this vegetation community was referred to by the older name of Riversidean sage scrub (Holland Element Code 32700). Under the more recent Sawyer et al. (2009) classification, this type of coastal scrub is best classified as California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance). CDFW ranks this community as S5 (secure – common, widespread, and abundant) and it is not considered sensitive.

California buckwheat scrub is present on the northeastern portion of the site on south, west, and east-facing slopes containing numerous rocky outcrops. Native shrubs and other conspicuous plants commonly observed in these areas include California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemisia californica*), and white sage (*Salvia apiana*). Other conspicuous plants include brittlebush (*Encelia farinosa*), yellow bush-penstemon (*Keckiella antirrhinoides*), wishbone bush (*Mirabilis laevis* var. *crassifolia*), sweetbush (*Bebbia juncea*), and black sage (*Salvia mellifera*). Annuals are also abundant in this community and include natives such as wreath plant (*Stephanomeria virgata*) and western sunflower (*Helianthus annuus*) and non-natives such as shortpod mustard (*Hirschfeldia incana*), red brome (*Bromus rubens*), slender wild oat (*Avena barbata*), and Mediterranean grass (*Schismus barbatus*).

Open patches can be found throughout portions of the buckwheat scrub onsite and contain a mixture of native and non-native annuals. Natives include popcorn flower (*Plagiobothrys* species), large flower rancher's fiddleneck (*Amsinckia intermedia*), common cryptantha (*Cryptantha intermedia*), evening primrose (*Camissonia* species), wild carrot (*Daucus pusillus*), slender tarweed (*Deinandra fasciculata*), and phacelia (*Phacelia* species). Other plants observed include chia (*Salvia columbariae*), perezia (*Acourtia microcephala*), hooked navarretia (*Navarretia hamata*), sapphire woollystar (*Eriastrum sapphirinum*), and fringed spineflower (*Chorizanthe fimbriata*).

3.2.2) Chamise Chaparral

In previous reports, this vegetation community was referred to by the older name of northern mixed chaparral (Holland Element Code 37130). Under the more recent Sawyer et al. (2009) classification, this vegetation community is best classified as chamise chaparral (*Adenostoma fasciculatum* Shrubland Alliance) or chamise–black sage chaparral (*Adenostoma fasciculatum–Salvia mellifera* Shrubland Alliance). CDFW ranks chamise chaparral as S5 (secure – common,

widespread, and abundant) and chamise-black sage chaparral at S4 (apparently secure – uncommon but not rare). The chaparral on the site is not considered sensitive.

Common species found in the chaparral areas onsite are chamise (*Adenostoma fasciculatum*), black sage, and other perennials. A poorly developed understory is usually present in association with chaparral and is characteristic of this vegetation community on the site.

Only small patches of remnant chaparral were observed on the site along the southern boundary. The survey in November 2021 found that a portion of the chamise chaparral on the site had been mowed to the ground.

3.2.3) Arroyo Willow Thickets and Mulefat Thickets

In previous reports, the riparian vegetation onsite was referred to by the older names of southern arroyo willow riparian (Holland Element Code 61320), mulefat scrub (Holland Element Code 63310), and disturbed wetland (Holland Element Code 11200). Under the more recent Sawyer et al. (2009) classification, this vegetation community is best classified as arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance) and mulefat thickets (*Baccharis salicifolia* Shrubland Alliance). CDFW ranks arroyo willow thickets as S4 (apparently secure – uncommon but not rare); however, it is considered sensitive. Mulefat thickets are ranked as S5 (secure – common, widespread, and abundant) and not considered sensitive.

Arroyo willow thickets and mulefat thickets are dependent on the presence of at least periodic surface or subsurface water. The northwestern portion of the site contains a degraded blue-line stream sparsely inhabited by arroyo willow (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), or a mix of the two. A single Fremont cottonwood tree (*Populus fremontii* ssp. *fremontii*), five southern California black walnut trees (*Juglans californica*), black willow (*Salix gooddingii*), and scattered blue elderberry (*Sambucus nigra* ssp. *cerulea*) and non-native tamarisks (*Tamarix* species) are also present. The understory is dominated by native and non-native annuals, including (but not limited to) shortpod mustard, western sunflower, large-flowered rancher's fiddleneck, Spanish clover (*Acmispon americanus*), wild radish (*Raphanus sativus*), mayweed (*Anthemis cotula*), prickly lettuce (*Lactuca serriola*), and non-native grasses, including wheat (*Triticum aestivum*) and oat (*Avena* species).

Surface water was not observed within any of the onsite drainage features during the surveys. Over the course of surveys since 2003, it has been noted that the density and health of riparian

shrubs and trees appears to be declining. Over time, some areas of the streambed and gaps in riparian vegetation have been incorporated into the surrounding agricultural fields.

3.2.4) Agriculture and Disturbed/Ruderal

In previous reports, agricultural fields and disturbed/ruderal areas onsite were referred to by the older designations of Holland Element Codes 18300 and 11300. Agriculture is not included under the more recent Sawyer et al. (2009) classification. Disturbed/ruderal areas that are strongly dominated by annual non-natives may be classified as semi-natural stands, such as *Brassica* (*nigra*) and Other Mustards Semi-natural Herbaceous Stands or *Bromus rubens*—*Schismus barbatus* Semi-natural Herbaceous Stands. These are not considered sensitive vegetation communities.

The majority of the site is under cultivation and consists of dry-farmed wheat crops. Invasive plants are found within farmed portions of the site, and include lamb's quarters (*Chenopodium murale*), calabazilla (*Cucurbita foetidissima*), and knotweed (*Polygonum aviculare*).

Disturbed habitat includes unvegetated areas (such as roads) and areas that contain mostly non-native plant species, including ornamentals and ruderal invasives. Some non-native and weedy species have invaded these areas, including short-pod mustard, red brome, redstem filaree (*Erodium cicutarium*), and various non-native grasses. Other non-native plant species observed in these areas include horehound (*Marrubium vulgare*), Russian thistle (*Salsola tragus*), and tumbling pigweed (*Amaranthus albus*).

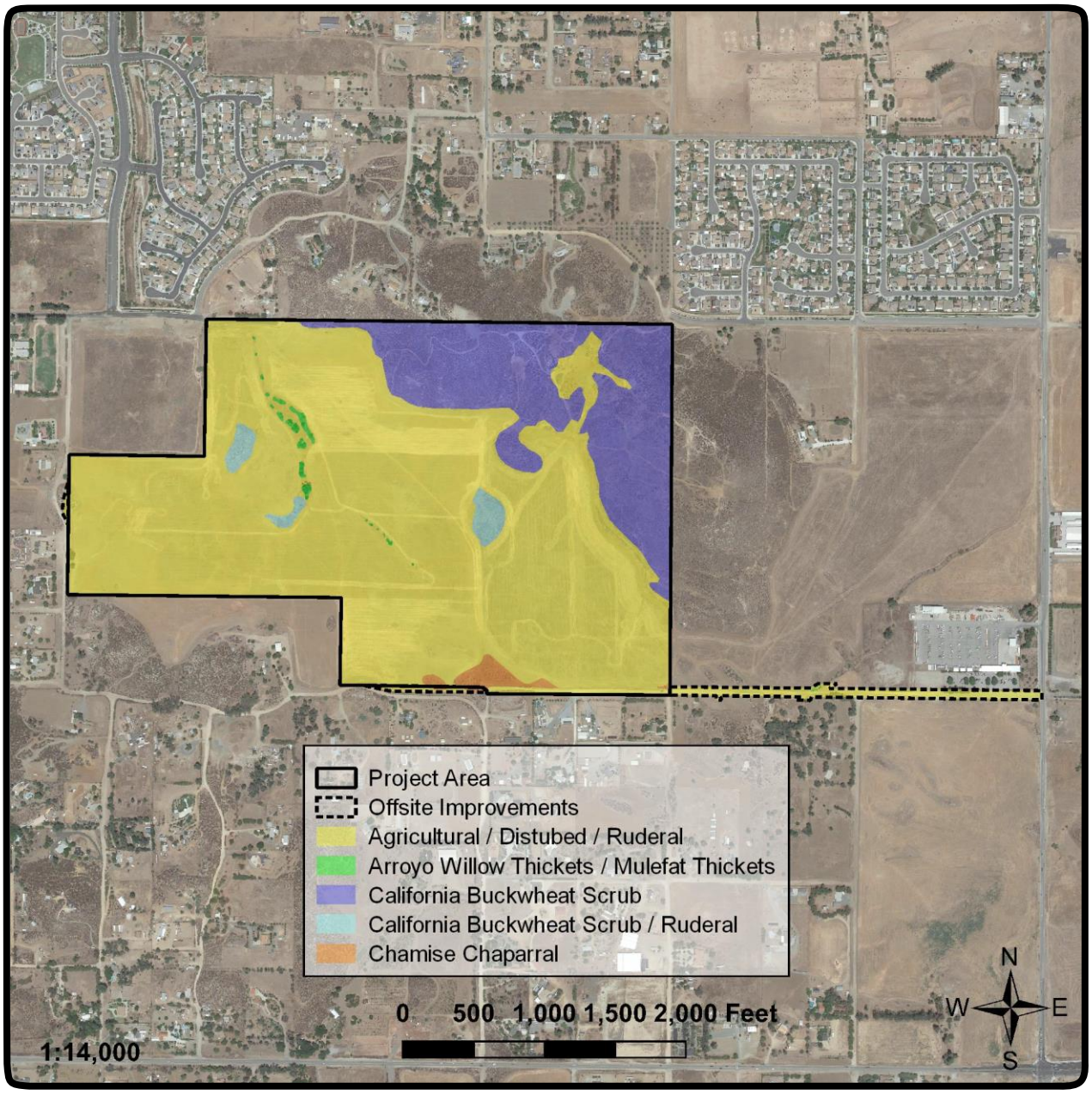

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Figure 7

Vegetation Community Map
(Photo obtained from Google Earth, February 2016)

Golden Meadows, TT 31194
City of Menifee, California

3.3) Plant Species

A total of 127 plant species were observed onsite during biological surveys conducted by L&L from 2003 through 2021. Of the 127 plant species present, 46 (36 percent) are non-natives. A list of all plant species identified onsite during previous and current surveys is included in Appendix A.

No state or federally listed plants were observed during surveys and the Project site is not within USFWS designated critical habitat for any listed plant species. Two special status plant species were observed on the site during surveys, long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*) and southern California black walnut (*Juglans californica*). Details of special status plant observations are provided in Table 5 and locations are mapped on Figure 8.

Table 5. Special Status Plant Species Observations

Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
Long-spined spineflower *Chorizanthe polygonoides var. longispina*	05.12.2017	33.655304, -117.187238	2	~1600
Southern California black walnut *Juglans californica*	09.22.2005 11.08.2021	33.653919, -117.192902	1	1517
	09.22.2005 11.08.2021	33.653955, -117.192924	1	1518
	11.08.2021	33.654018, -117.193226	1	1519
	11.08.2021	33.653468, -117.192879	1	1517
	11.08.2021	33.652603, -117.192823	1	1522

Long-spined spineflower is an annual herb in the Polygonaceae (Buckwheat) family. It is found in chaparral, coastal scrub, meadows and seeps, valley and foothill grasslands, and vernal pools at 100 to 5,020 feet elevation. It flowers from April through July. This species is found in Riverside, Orange, and San Diego Counties and Baja California, Mexico (CNPS 2021).

This species is not state or federally listed as threatened or endangered. It has a California Rare Plant Rank (CRPR) of 1B.2 (rare or endangered in California and elsewhere, moderately threatened in California). It is a covered species under the MSHCP and considered adequately conserved.

Long-spined spineflower was observed on the site in 2017. Two (2) plants were observed on clay soils within California buckwheat scrub in the northeast portion of the site along an east-west ridgeline. This area has been impacted by OHV use and the species has not been observed during subsequent surveys. Long-spined spineflower has also been documented by the CNDDB (Element Occurrence #57) on the east-central portion of the site. This record is from 2004 and estimates at least 100,000 plants on five acres of the site. It was not observed in this location during L&L surveys.

Southern California black walnut is a deciduous tree in the Juglandaceae (Walnut) family. It is found in chaparral, cismontane woodland, coastal scrub, and riparian woodland at 165 to 2,955 feet elevation. It is endemic to California and found in portions of southern, central, and northern California (CNPS 2021).

This species is not state or federally listed as threatened or endangered. It has a CRPR of 4.2 (limited distribution, moderately threatened in California). It is a covered species under the MSHCP and considered adequately conserved.

Five (5) southern California black walnut trees were observed in the riparian area in the central portion of the site. Representative photos are provided in Appendix D.

Three (3) additional special status plant species have a low to moderate or moderate potential to occur on the Project site but not been observed during surveys (see Appendix B). These species are:

- smooth tarplant (*Centromadia pungens ssp. laevis*; CRPR 1B.1 [rare or endangered in California and elsewhere, seriously threatened in California]),
- Parry's spineflower (*Chorizanthe parryi var. parryi*; CRPR 1B.1), and
- small-flowered morning-glory (*Convolvulus simulans*; CRPR 4.2).

These three (3) species are all covered under the MSHCP and considered adequately conserved.

3.3.1) Trees

There is a single immature coast live oak tree (*Quercus agrifolia*) present on the site within the riparian area. Other native trees on the site are blue elderberry, southern California black walnut, Fremont cottonwood, arroyo willow, and black willow. Non-native and escaped ornamental trees on the site include Peruvian pepper tree (*Schinus molle*), eucalyptus, tree tobacco (*Nicotiana glauca*), and tamarisk. The City may regulate removal or replacement of trees and a tree survey may be required.

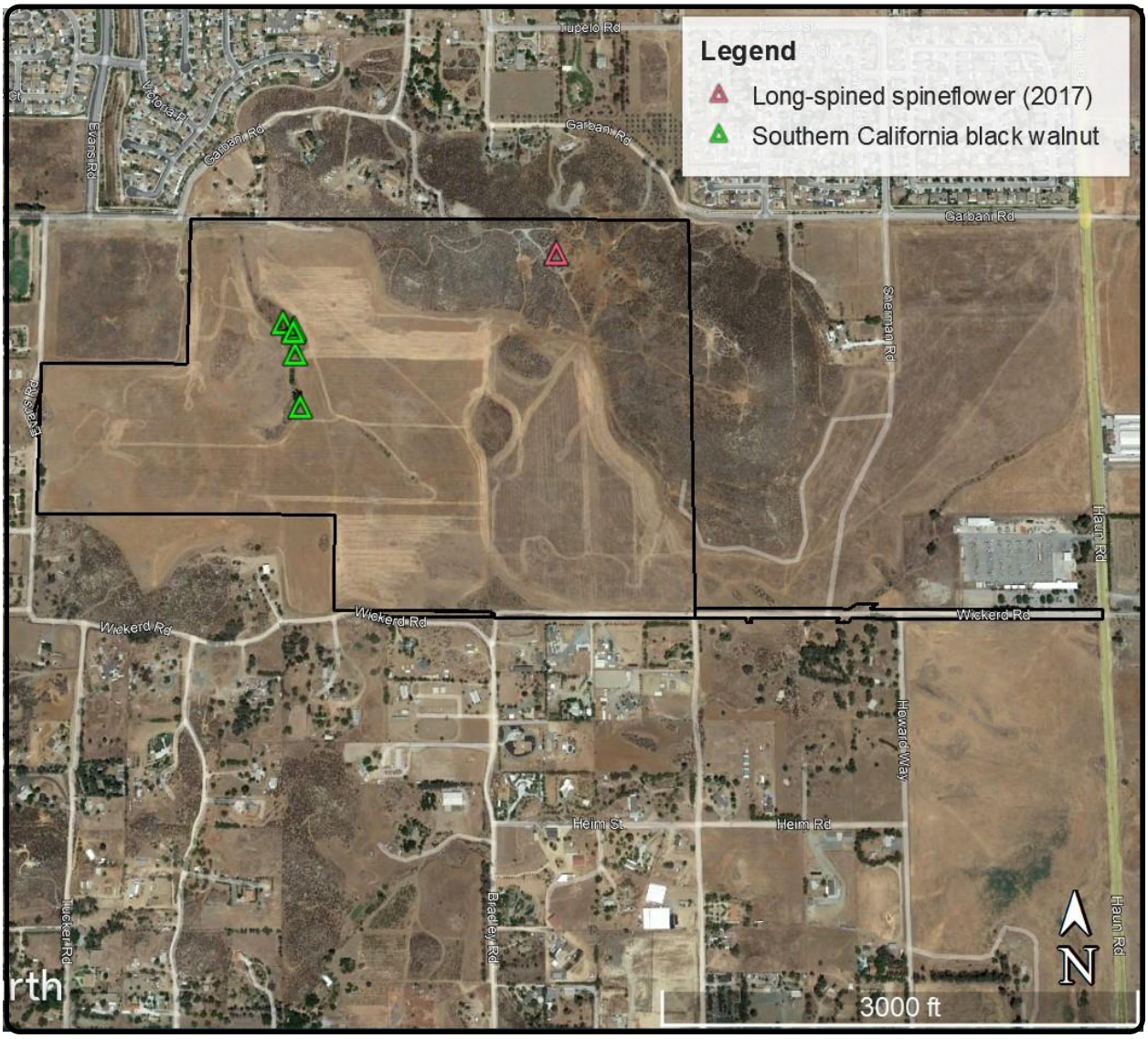

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Figure 8

Special Status Plant Observations

(Photo obtained from Google Earth, August 2021)

Golden Meadows, TT 31194
City of Menifee, California

3.4) Wildlife Species

A total of 85 vertebrate wildlife species, plus domestic dog, have been detected during L&L's biological surveys of the site from 2003 through 2021. An additional 15 common butterfly species were observed (during Quino checkerspot butterfly surveys in 2004) but this does not represent a comprehensive list of insects present. A list of all wildlife species identified onsite is provided in Appendix A. Details of listed and special status species observations are provided in Table 6 and observations are mapped on Figure 9. CNDDB forms for 2021 observations are included in Appendix E.

Table 6. Listed and Special Status Wildlife Species Observations

Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
Coast horned lizard *Phrynosoma blainvillii*	04.26.2011	33.655640, -117.188980	1	1723
	2004*	--	--	--
Orange-throated whiptail *Aspidoscelis hyperythra*	2004*	--	--	--
Coastal (western) whiptail *Aspidoscelis tigris stejnegeri*	2005*	--	--	--
	2004*			
Raptor nest site	2013, 2017, 2018, 2019	33.652749, -117.192797	1 nest (inactive)	1520
Cooper's hawk *Accipiter cooperii*	06.07.2021	33.653876, -117.193126	1	1518
	05.21.2021	33.653050, -117.192942	1	1522
	2007*	--	--	--
	2005	33.652173, -117.191589	2	1524
	2004*	--	--	--
Northern harrier *Circus hudsonius*	2013*	--	--	--
	2011*	--	--	--
	2004*	--	--	--
White-tailed kite *Elanus leucurus*	04.26.2011	33.653036, -117.191520	1	Fly over
	2005	33.652143, -117.193236	1	1523
	2005	33.655034, -117.194991	1	1508

Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
California horned lark *Eremophila alpestris actia*	07.06.2021	33.649724, -117.189071	Several	1542
	06.05.2021 05.21.2021	33.650884, -117.185290	Several	1558
	05.25.2021	33.651187, -117.197238	Several	1537
	05.28.2019	33.653331, -117.191005	Several	1524
	04.16.2019	33.650844, -117.185067	Several	1557
	06.14.2018	33.653079, -117.191911	Several	1520
	05.24.2018	33.650510, -117.185130	Several	1548
	04.25.2017	33.653816, -117.188586	Several	1556
	04.08.2017	33.653324, -117.194038	Several	1519
	04.01.2017	33.652212, -117.186278	Several	1560
	09.17.2013	33.651900, -117.186140	20+	1561
	2004*	--	--	--
	07.2003*	--	--	--
Great egret *Ardea alba*	2004*	--	--	--
Great blue heron *Ardea herodias*	04.01.2017	33.655683, -117.194971	1	Fly over
	2005*	--	--	--
Lawrence's goldfinch *Spinus lawrencei*	2004*	--	-	--
Loggerhead shrike *Lanius ludovicianus*	2005	33.654408, -117.193684	1	1517
California thrasher *Toxostoma redivivum*	2005*	--	--	--
	2004*	--	--	--
Southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	2004*	--	--	--
Bell's sage sparrow *Artemisiospiza belli belli*	2004*	--	--	--
Nuttall's woodpecker *Dryobates nuttallii*	07.06.2021	33.653838, -117.193080	1 male	1517

Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
Coastal California gnatcatcher *Polioptila californica californica*	06.07.2021 05.31.2021	33.654966, -117.184909	2 males 1 female	1643
	04.16.2019	33.655093, -117.189888	1	1629
	03.11.2019[1]	33.655673, -117.184620	1	1557
	05.24.2018	33.655112, -117.185740	2 (a pair)	1576
	04.01.2017	33.655336, -117.190141	1 male	1621
	03.28.2017	33.654170, -117.185007	1 male	1656
	03.28.2017[2]	33.655604, -117.184969	2 (a pair)	1576
	04.29.2011	33.65529, -117.19003	2 (a pair)	1637
	04.26.2011	33.65548, -117.19102	1 male	1557
	04.19.2004	33.656002, -117.192037 (just offsite)	Active nest	1547
	04.04.2004	33.655400, -117.190183	Active nest	1624
	04.04.2004	33.651783, -117.184550	Active nest	1627
Burrowing owl *Athene cunicularia*	05.30.2018	33.650610, -117.188668	1 adult 1 burrow	1536
Wrentit *Chamaea fasciata*	07.11.2021	33.651355, -117.184692	1	1610
	05.31.2021	33.655169, -117.188866	1	1672
	07.2003*	--	--	--
Costa's hummingbird *Calypte costae*	2011*	--	--	--
	2004*	--	--	--
Rufous hummingbird *Selasphorus rufus*	2004*	--	--	--
San Diego black-tailed jackrabbit *Lepus californium bennettii*	05.25.2021	33.653599, -117.188042	1	1563
	06.14.2018	33.654478, -117.193719	1	1512
	03.28.2017[3]	33.654645, -117.185019	2	1650
	04.01.2017	33.654137, -117.187498	2	1583
	2013	33.655294, -117.190818	1	1563
	2013	33.651907, -117.188694	1	1545
	2013	33.649095, -117.188265	1	1570

Species	Date	GPS Coordinates (Decimal Degrees)	Number Detected	Elevation (feet)
San Diego black-tailed jackrabbit *Lepus californium bennettii* (continued)	2013	33.649251, -117.179982 (offsite)	1	1513
	04.26.2011	33.649020, -117.188010	1	1579
	04.26.2011	33.651790, -117.188670	1	1546
	04.26.2011	33.655230, -117.190810	1	1557
	04.26.2011	33.655703, -117.186478	1	1661
	04.26.2011	33.654188, -117.184800	1	1667
	04.26.2011	33.652306, -117.184658	1	1632
	04.26.2011	33.654389, -117.186578	1	1607
	04.26.2011	33.654851, -117.190446	1	1592
	04.26.2011	33.655064, -117.189181	1	1657
	04.26.2011	33.655727, -117.185042	1	1570
	2004*	--	--	--

*Details of observations are not available. 1. Coastal California gnatcatcher detected during unrelated survey of adjacent property. 2. Coastal California gnatcatcher was also detected in the same approximate areas on 04.08.2017, 04.25.2017, and 05.06.2017. These are likely the same individuals previously detected in the area. 3. Black-tailed jackrabbit was also detected in the same approximate areas on 04.08.2017 and 05.06.2017; number of individuals was not determined.

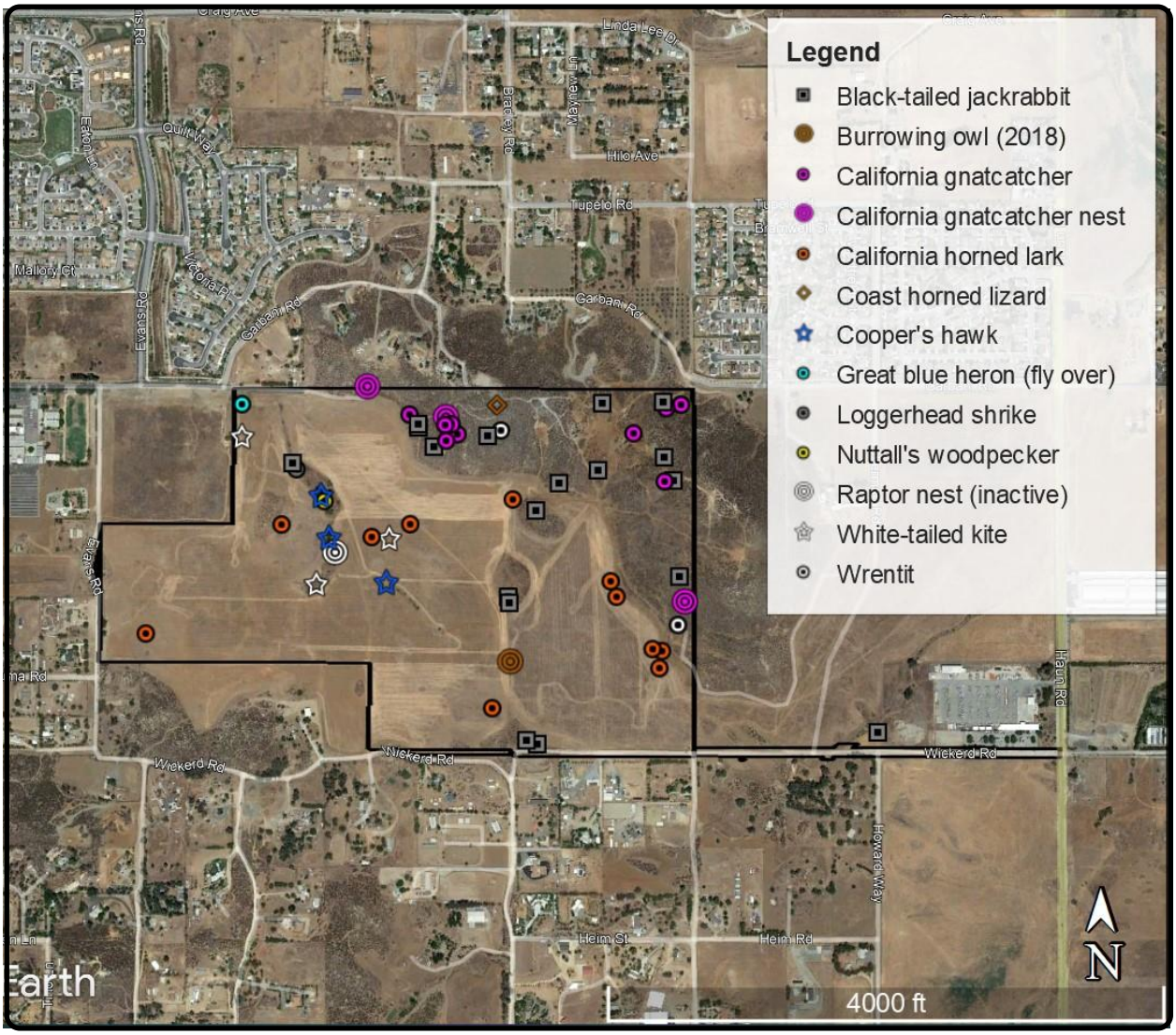

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Figure 9

Special Status Wildlife Observations (2003-2021)

(Photo obtained from Google Earth, August 2021)

Golden Meadows, TT 31194
City of Menifee, California

3.4.1) Listed and Fully Protected Wildlife

Biological surveys conducted on the Project site by L&L from 2003 to 2021 detected two listed or fully protected wildlife species on the site, coastal California gnatcatcher (*Polioptila californica californica*) and white-tailed kite (*Elanus leucurus*), discussed below.

Two other listed species have not been observed on the Project site during surveys but have a moderate or high potential to occur, Stephens' kangaroo rat (*Dipodomys stephensii*) and tricolored blackbird (*Agelaius tricolor*) (see Appendix B).

Stephens' kangaroo rat is federally listed as endangered and state listed as threatened. Based on potentially suitable habitat and multiple documented occurrences in the Project vicinity (CDFDW 2021c), this species has a high potential to occur on the site. Stephens' kangaroo rat is a covered species under the MSHCP and considered adequately conserved. Focused trapping surveys for this species are not required by the MSHCP.

Tricolored blackbird is state listed as threatened. Based on potentially suitable foraging habitat and several eBird records (eBird 2021) in the Project vicinity, this species has a low to moderate potential to forage on the site, but there is no suitable nesting habitat. Tricolored blackbird is a covered species under the MSHCP and considered adequately conserved.

Coastal California Gnatcatcher

Coastal California gnatcatcher is federally listed as threatened and a CDFW Species of Special Concern. Coastal California gnatcatcher is a covered species under the MSHCP and considered adequately conserved. Focused surveys for this species are not required by the MSHCP; however the MSHCP limits disturbance to outside the nesting season.

Surveys from 2004 to 2021 have documented coastal California gnatcatchers on the Project site (Table 6). Nesting was observed in 2004 and breeding pairs were present in 2011, 2017, and 2018. Coastal California gnatcatchers were observed in 2021 and, although nesting was not observed, it is likely. All observations were in the California buckwheat scrub habitat in the northeastern portion of the site (Figure 9).

White-tailed Kite

White-tailed kite (*Elanus leucurus*) is a CDFW Fully Protected species. The classification of Fully Protected was California's initial effort to identify and protect rare wildlife species. With a few exceptions, Fully Protected species have subsequently been listed under the California

and/or Federal Endangered Species Acts. One of the exceptions is white-tailed kite, which is not state or federally listed, but retains its Fully Protected status. White-tailed kite is a covered species under the MSHCP and considered adequately conserved.

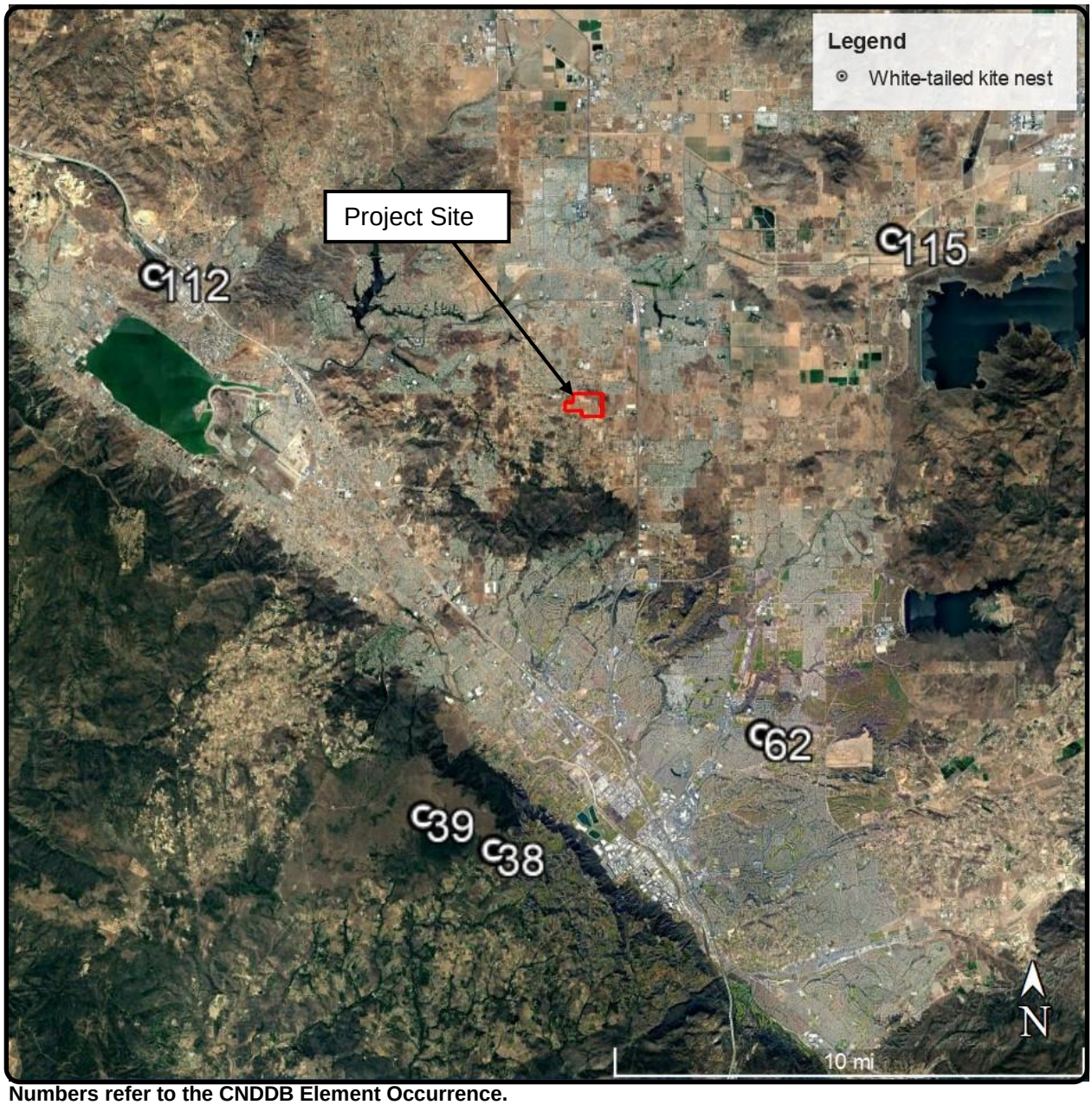
White-tailed kite forages in open grasslands, farmlands, meadows, and wetlands. Nests are located near foraging areas in substantial groves of dense, broad-leafed trees. Nests are built near the top of oaks, willows, or other trees, usually between 20 to 100 feet above the ground. The nest is composed of loosely piled sticks, lined with grass, straw, or rootlets. White-tailed kite breeds from February to October, with a peak from May to August (Zeiner et al. 1990).

The CNDDB (CDFW 2021c) has documented occurrences of five (5) white-tailed kite nests within 10 miles of the Project site (Figure 10):

> Occurrence 38 is approximately 9.3 miles south-southwest of the Project site. The occurrence is located at the Santa Rosa Plateau Preserve within oak savannah and native grassland at an elevation of 1,950 feet. Successful nesting was last documented in 1988 and 1989. Google Earth images show undisturbed habitat present in that area and the occurrence is presumed extant.
>
> Occurrence 39 is approximately 9.2 miles southwest of the Project site. The occurrence is described as located on private land between two parcels of Santa Rosa Plateau Preserve property. The habitat is oak savannah and native grassland at an elevation of 1,820 feet. The nest was last observed in 1989 (active nest, outcome unknown) and noted as threatened by proposed development. Examination of Google Earth images shows undisturbed habitat present in that area. The occurrence is presumed extant.
>
> Occurrence 62 is approximately 7.5 miles southeast of the Project site in Murrieta. The occurrence is located in southern riparian scrub habitat at an elevation of 1,240 feet. The record notes that the area was proposed for development, and Google Earth images now show the occurrence within a narrow area of habitat surrounded by residential developments. A pair of white-tailed kites was last observed in 1999. The occurrence is presumed extant but may have been extirpated by development.
>
> Occurrence 112 is approximately 9.4 miles west-northwest of the Project site and just north of Lake Elsinore. The occurrence is located in willow riparian woodland at an elevation of 1,258 feet. Successful nesting was documented in 2006. Google Earth images show undisturbed habitat at that location and the occurrence is presumed extant.

Occurrence 115 is approximately 7.1 miles northeast of the Project site. The occurrence is located in a small grove of trees associated with a rural residence in Winchester, north of Diamond Valley Lake. Agricultural fields are also present in the area. Successful nesting was documented in 2005 and 2006. Google Earth images show trees and agricultural fields remain in the area, as described in the CNDDB record. The occurrence is presumed extant.

Two white-tailed kites were observed on the Project site in 2005 and one in 2011 (Table 6, Figure 9). No kites have been observed during more recent surveys. Although this species may forage on the Project site and potentially suitable nesting habitat is present, no nesting has been observed there. A raptor nest was present in a eucalyptus tree in the riparian area on the site but has been observed during surveys to be either inactive or potentially associated with red-tailed hawk (*Buteo jamaicensis*) nesting. The 2021 survey found that this nest is no longer present.



Numbers refer to the CNDDB Element Occurrence.

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Figure 10

White-tailed Kite Nests within 10 Miles of the Project Site

(Photo obtained from Google Earth, August 2021)

Golden Meadows, TT 31194
City of Menifee, California

Fairy Shrimp

The two listed fairy shrimp species known from the area are vernal pool fairy shrimp (*Branchinecta lynchi*), a federally listed threatened species, and Riverside fairy shrimp (*Streptocephalus woottoni*), a federally listed endangered species. Both species are covered by the MSHCP and surveys are required where suitable habitat is present.

Vernal pool fairy shrimp is restricted to seasonal pools and prefers cool-water pools that are often short lived. Riverside fairy shrimp is restricted to deep seasonal vernal pools, ephemeral ponds, stock ponds, and other human-modified depressions. Riverside fairy shrimp prefers warm-water pools that remain filled for extended periods of time (Dudek 2003).

Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys. No fairy shrimp or potential fairy shrimp habitat was observed during current or previous surveys.

Riparian Birds

Least Bell's vireo (*Vireo bellii pusillus*) is state and federally listed as endangered. It is a covered species under the MSHCP and considered adequately conserved, but surveys are required in suitable habitat as described in MSHCP Section 6.1.2 and mitigation is required if the species is present. This species is migratory and breeds in California, arriving in March and departing by September or October. Males establish and defend territories in riparian woodlands and riparian scrub. Territory size ranges from 0.5 to 7.5 acres (USFWS 1998). Dense shrub cover is required for nesting.

There are two (2) CNDDB documented occurrences of nesting least Bell's vireo within five (5) miles of the site. The closest is Element Occurrence (EO) #412, located along the San Jacinto River just south of Canyon Lake, 4.2 miles to the west-northwest of the site. This occurrence is from 2002 and documents one (1) least Bell's vireo territory.

EO #407 is 4.5 miles west-northwest of the site along the San Jacinto River east of Lake Elsinore. This occurrence had one least Bell's vireo territory in 2003, two territories in 2004 and 2005, one singing male in 2006, six territories and two pairs with fledglings in 2009, and nine territories in 2010.

Southwestern willow flycatcher (*Empidonax traillii extimus*) is state and federally listed as endangered. It is a covered species under the MSHCP and considered adequately conserved, but surveys are required in suitable habitat as described in MSHCP Section 6.1.2 and mitigation is required if the species is present. This species inhabits dense riparian forests with ample numbers of willows and other associated trees and shrubs.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is federally listed as threatened and state listed as endangered. It is a covered species under the MSHCP and considered adequately conserved, but surveys are required in suitable habitat as described in MSHCP Section 6.1.2 and mitigation is required if the species is present. This species inhabits extensive riparian thickets or forests with dense, low-level or understory foliage and abutting on slow-moving watercourses, backwaters, or seeps.

There are no CNDDB documented occurrences of nesting southwestern willow flycatcher or western yellow-billed cuckoo within five (5) miles of the site.

The habitat assessment found that riparian vegetation on the site is distributed intermittently along a linear area that is approximately 1,500-feet long (Figure 7). The riparian area is no more than two or three shrubs across at its widest points and surrounded by agricultural fields. The understory is poorly developed and has several introduced species. Representative photos are included in Appendix D.

No least Bell's vireo, southwestern willow flycatcher, or western yellow-billed cuckoo have been incidentally detected during surveys. Riparian vegetation onsite is scattered and degraded, the understory is poorly developed, and the streambed does not have persistent water flow. Typical habitat to support least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo is not present and these species are considered absent from the site.

Quino Checkerspot Butterfly

Quino checkerspot butterfly (*Euphydryas editha quino*) is federally listed as endangered. No adults, larvae, or pupae were observed onsite during focused surveys in 2004, although potentially suitable habitat and larval host and nectaring plant species are present. This species has not been incidentally observed during any subsequent surveys. Quino checkerspot butterfly is a covered species under the MSHCP and considered adequately conserved. Focused surveys are not required by the MSHCP.

3.4.2) Special Status Wildlife

In addition to coastal California gnatcatcher and white-tailed kite, discussed above, biological surveys conducted on the Project site by L&L from 2003 to 2021 detected 19 special status wildlife species on the site:

- orange-throated whiptail (*Aspidoscelis hyperythra*; CDFW Watch List),
- coastal (western) whiptail (*Aspidoscelis tigris stejnegeri*; CDFW Species of Special Concern),
- coast horned lizard (*Phrynosoma blainvillii*; CDFW Species of Special Concern),
- Cooper's hawk (*Accipiter cooperi*; CDFW Watch List),
- southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*; CDFW Watch List species),
- great egret (*Ardea alba*; CDFW Special Animal),
- great blue heron (fly over) (*Ardea herodias*; CDFW Special Animal),
- Bell's sage sparrow (*Artemisiospiza belli belli*; USFWS Bird of Conservation Concern, CDFW Watch List species),
- burrowing owl (*Athene cunicularia*, USFWS Bird of Conservation Concern, CDFW Species of Special Concern),
- Costa's hummingbird (*Calypte costae*; USFWS Bird of Conservation Concern, CDFW Special Animal),
- wrentit (*Chamaea fasciata*; USFWS Bird of Conservation Concern),
- northern harrier (*Circus cyaneus*; CDFW Species of Special Concern),
- Nuttall's woodpecker (*Dryobates nuttallii*; USFWS Bird of Conservation Concern),
- California horned lark (*Eremophila alpestris actia*; CDFW Watch List),
- loggerhead shrike (*Lanius ludovicianus*; USFWS Bird of Conservation Concern, CDFW Species of Special Concern),
- rufous hummingbird (*Selasphorus rufus*; USFWS Bird of Conservation Concern, CDFW Special Animal),
- Lawrence's goldfinch (*Spinus lawrencei*; USFWS Bird of Conservation Concern, CDFW Special Animal),
- California thrasher (*Toxostoma redivivum*; USFWS Bird of Conservation Concern), and
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*; CDFW Species of Special Concern).

All of these species are covered under the MSHCP and considered adequately conserved, with the exception of great egret, Costa's hummingbird, wrentit, Nuttall's woodpecker, rufous hummingbird, Lawrence's goldfinch, and California thrasher, which are not covered under the MSHCP. Burrowing owl is discussed below. Special status species observations are listed in Table 6 and mapped on Figure 9.

Five (5) additional special status wildlife species have a low to moderate potential to occur on the Project site but have not been observed during L&L surveys (see Appendix B). These species are:

- Crotch bumble bee (*Bombus crotchii*; CDFW Special Animal[2]),
- southern California legless lizard (*Anniella stebbinsi*; CDFW Species of Special Concern),
- Dulzura pocket mouse (*Chaetodipus californicus femoralis*; CDFW Species of Special Concern),
- northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*; CDFW Species of Special Concern), and
- western mastiff bat (foraging) (*Eumops perotis californicus*; CDFW Species of Special Concern).

Northwestern San Diego pocket mouse is covered under the MSHCP and considered adequately conserved. The remaining four species are not covered under the MSHCP.

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is protected under the federal Migratory Bird Treaty Act and California Fish and Game Code and is a CDFW Species of Special Concern. It is a small, ground-dwelling owl found in open dry grassland, desert, or shrubland areas and in uncultivated agricultural areas, rangelands, and other open areas with low-growing vegetation.

Burrows are an essential element of burrowing owl habitat. Although the burrowing owl is capable of excavating its own burrows in soft soils, it typically modifies and inhabits abandoned

[2] Crotch bumble bee was previously a candidate for state listing, but the Sacramento Superior Court ruled that insects are not eligible for listing under the California Endangered Species Act: *Almond Alliance of California v. California Department of Fish and Wildlife*, Sacramento Superior Court No. 34-2019-80003216 (Nov. 13, 2020). The California Fish and Game Commission filed an intent to appeal this decision in February 2021. The status of this species may be affected by subsequent litigation or changes to regulations.

burrows of small mammals, such as ground squirrels and pocket gophers. The burrowing owl has also been known to use man-made structures such as cement culverts, debris piles, and other artificial burrows.

Occupancy of burrowing owl habitat can be verified at a site by observation of at least one (1) owl or sign of owl (molted feathers, cast pellets, prey remains, eggshell fragments, or excrement) at or near a burrow entrance. A site is considered occupied if at least one (1) owl has been identified onsite in the past three (3) years, because (if undisturbed) burrowing owls exhibit high site fidelity (CDFG 2012, CBOC 1993).

The site has suitable burrowing owl habitat. Focused surveys for burrowing owl in 2005, 2006, 2007, 2011, and 2013 did not detect burrowing owls utilizing the site. No burrowing owl or sign was observed during 2017 general biological surveys.

Focused surveys in 2018 observed a single adult burrowing owl onsite and one (1) burrow with signs of occupation (Table 6, Figure 9). The owl was observed on May 30, 2018. The occupied burrow was found very close to where the owl was observed. Pellets, scat, feathers, owl tracks, and pieces of shredded cloth were observed at the burrow entrance. The burrow was monitored during subsequent site visits, but there were no additional observations of burrowing owl adults or juveniles. It was not determined if the owl was using the burrow for nesting. Coyote and/or dog tracks were observed around the burrow, but the burrow itself was not disturbed and there were no signs that owls had been predated. No other active burrows or burrowing owls were observed during surveys in 2018.

Focused surveys in 2019 did not detect any burrowing owl, occupied burrows, or owl sign. The agricultural fields on the site, including the site of the 2018 burrow observation, had tall, dense non-native vegetation at that time, which created unsuitable conditions for burrowing owl. Thick vegetation was also present at the burrow site in 2021, until the agricultural fields were mowed (sometime between August and November surveys).

No burrowing owls, owl sign (pellets, scat, feathers, tracks, etc.), or occupied burrows were observed onsite during the 2021 protocol breeding season survey. No owls or owl sign were observed at the 2018 burrow site in November 2021 after the agricultural fields were mowed. Potentially suitable burrowing owl habitat is present on the site, including small mammal burrows. Potentially suitable habitat is also present within the 150-meter buffer area (Figure 5), but no owls, owl sign, or occupied burrows were observed in the buffer.

There are 47 CNDDB documented occurrences of burrowing owl within five (5) miles of the Project site (CDFW 2021c). These occurrences date between 1998 and 2016.

Because suitable habitat is present, the MSHCP requires a preconstruction clearance survey for burrowing owl within 30 days prior to the start of site disturbance. If burrowing owls are found on the site at that time, additional mitigation is required under the MSHCP (see Section 6.10).

Nesting Birds

There is habitat suitable for nesting birds (including raptors) within and adjacent to the site. Nesting birds may utilize trees, shrubs, and other vegetation, and open ground on and adjacent to the site for nesting. Some relatively large eucalyptus trees are present on the western portion of the site and along the western boundary along Evans Road. Red-tailed hawks (*Buteo jamaicensis*) have been observed onsite and may be utilizing the trees for nesting.

A potential (inactive) raptor nest site was found in a large eucalyptus tree on the site in 2013. It was located in a eucalyptus tree in the west-central portion of the site (Table 6, Figure 9). No raptors were observed utilizing the nest site during surveys in 2013, 2017, 2018, and 2019. The 2021 survey found that the nest was no longer present and likely fell from the tree.

3.4.3) Wildlife Corridor

Wildlife corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated “islands” of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because movement barriers prohibit the infusion of new individuals and genetic variation.

Wildlife movement activities usually fall into one of three movement categories: dispersal (e.g., juvenile animals dispersing from natal areas or individuals extending their range), seasonal migration, and movements related to home range activities (e.g., foraging for food or water, defending territories, or searching for mates, breeding areas, or cover).

Drainages often serve as wildlife corridors and travel routes; however, the riparian vegetation on the site is not continuous. The site is largely surrounded by scattered existing development and

there is no connectivity between the site and conserved lands to the east (Diamond Valley Lake) and southwest (Santa Rosa Plateau, Cleveland National Forest).

The California Essential Habitat Connectivity Project (CDFW 2021d) maps the Project site and surrounding areas as "limited connectivity opportunity." Although there may be limited local movement of wildlife on and across the site, it is not within or adjacent to a wildlife corridor or potential corridor.

3.5) Jurisdictional Waters/Wetlands and MSHCP Riparian/Riverine and Vernal Pool Habitat

Under MSHCP Volume 1, Section 6.1.2, areas associated with wetland and streambed systems must be evaluated for consideration as riparian/riverine or vernal pool habitat. Riparian/riverine areas are defined within the MSHCP as:

> ". . . lands which contain Habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year."

Vernal pools are defined within the MSHCP as:

> ". . . seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. . ."

An ephemeral drainage is present on the site and mapped as a USGS blue-line stream (Figure 11). This drainage includes riparian vegetation such as arroyo willow, Fremont cottonwood, and mulefat (see Section 3.2.3). A jurisdictional delineation was completed in 2011 and updated in 2018 and 2019.

The delineation found 0.43 acre of unvegetated state streambed (which is also MSHCP riverine habitat) and 0.93 acre of state wetland (which is also MSHCP riparian habitat). The survey also identified 0.10 acre of federal Waters of the U.S. (WoUS), none of which is federal wetland (Table 7).

All jurisdictional areas onsite will either be impacted by Project development or incorporated into the Avoidance/Compatible Use Area (Figure 12). The Avoidance/Compatible Use Area will retain native riparian habitat.

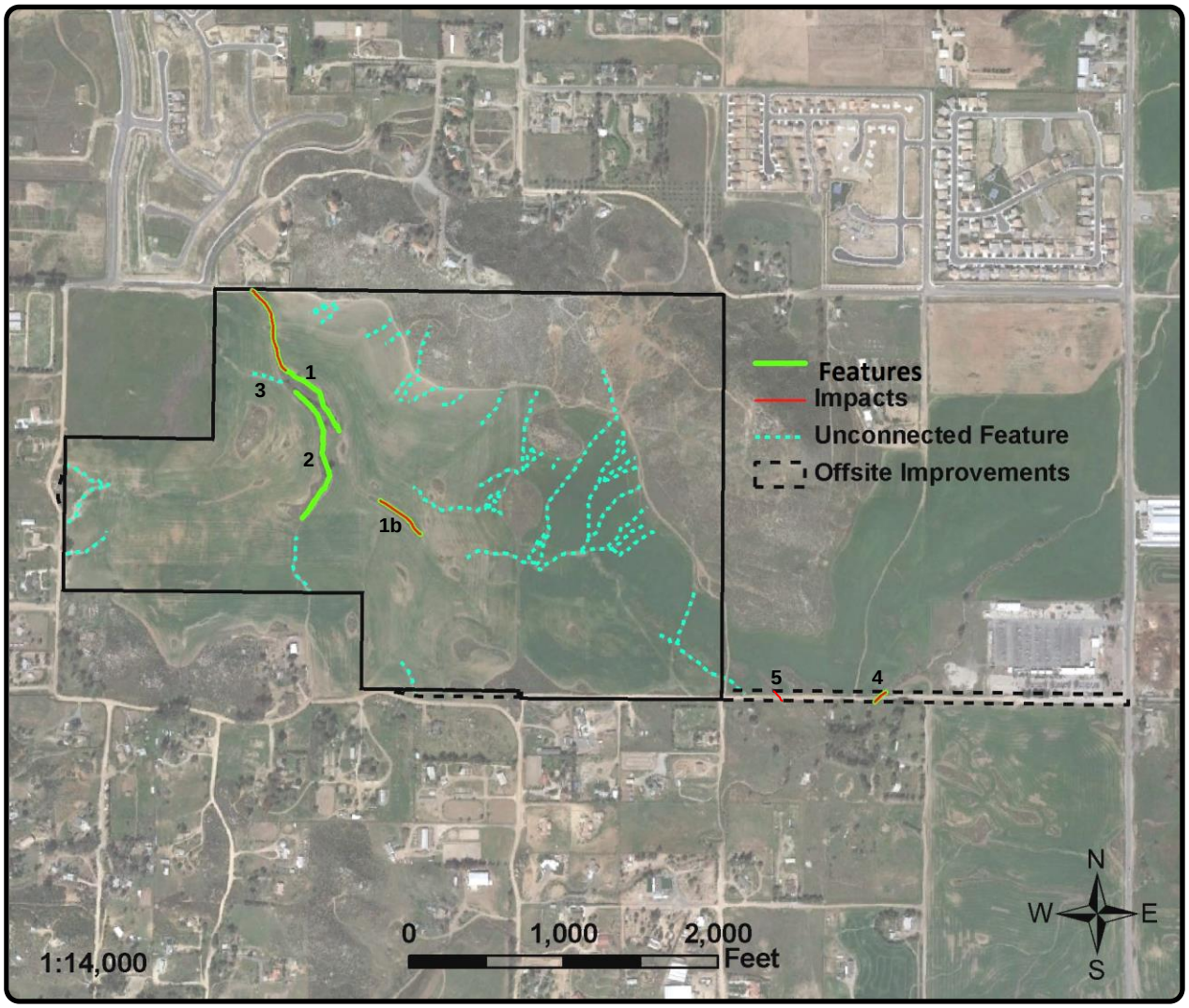
Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys.

Table 7. Summary of Jurisdictional Resources Present

Feature	Total Present sq. ft. (acres)			
	State Streambed / MSHCP Riverine Sq. ft.	State Wetland / MSHCP Riparian Sq. ft.	Federal Waters Sq. ft.	Federal Wetland Sq. ft.
1	6,842	15,916	1,290	0
1b	1,797	2,751	716	0
2	8,275	20,913	1,806	0
3	0	0	0	0
4 (offsite)	1,289	871	325	0
5 (offsite)	611	0	260	0
TOTALS	**18814 (0.43 ac)**	**40,451 (0.93 ac)**	**4,397 (0.10 ac)**	**0**

Table 8. Summary of Jurisdictional Impacts

Feature	Total Impacts sq. ft. (acres)			
	State Streambed / MSHCP Riverine Sq. ft.	State Wetland / MSHCP Riparian Sq. ft.	Federal Waters Sq. ft.	Federal Wetland Sq. ft.
1	5498	1824	0	0
1b	1797	2751	716	0
2	346	256	0	0
3	0	0	0	0
4 (offsite)	1289	871	325	0
5 (offsite)	611	0	260	0
TOTALS	**9,541 (0.219 ac)**	**5,702 (0.131 ac)**	**1301 (0.029 ac)**	**0**



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BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

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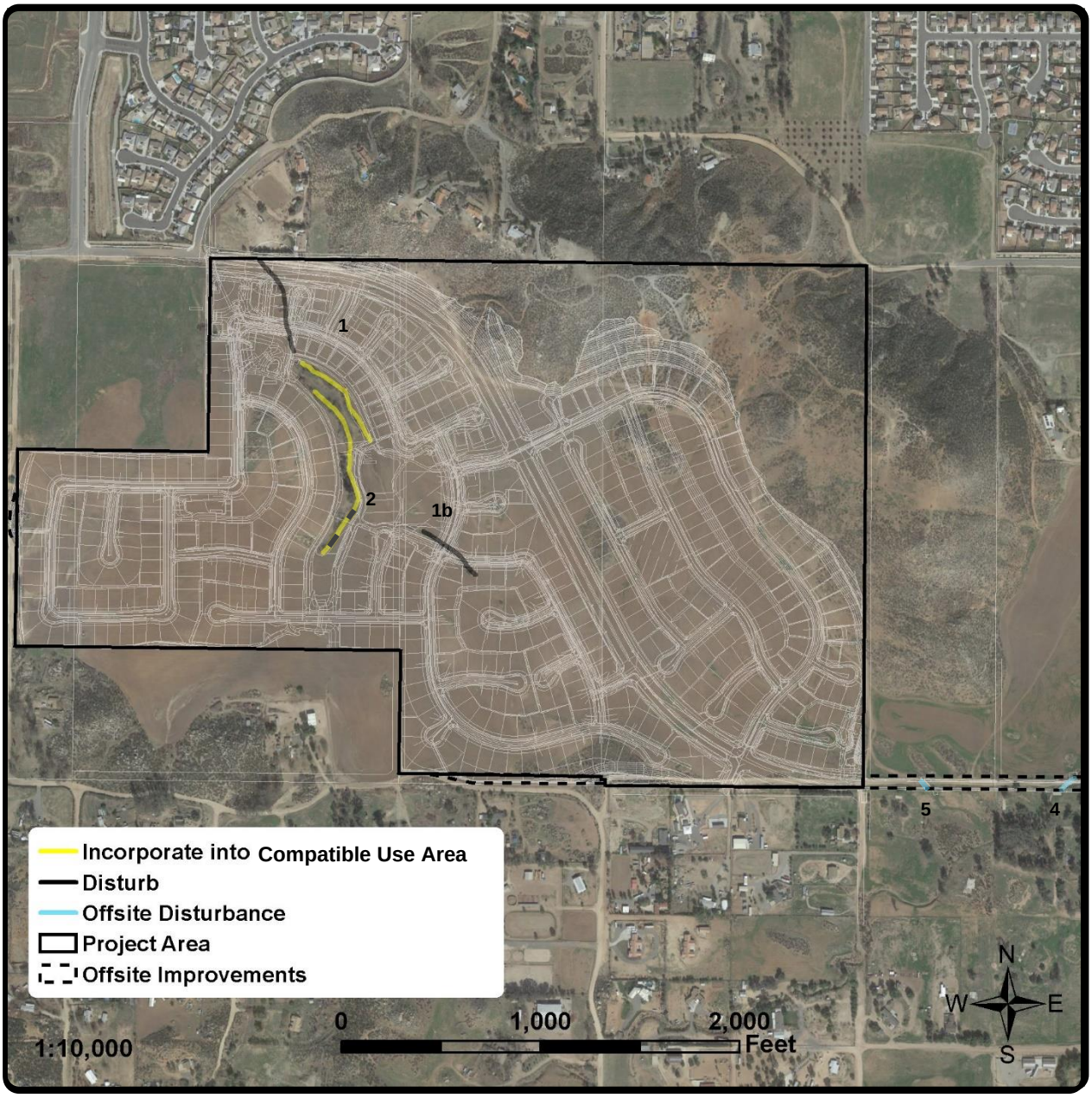
Figure 11

Jurisdictional Areas
(Photo obtained from Google Earth, 3-9-2011)

Golden Meadows, TT 31194
City of Menifee, California



L&L Environmental, Inc.

BIOLOGICAL AND CULTURAL INVESTIGATIONS AND MONITORING

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Figure 12

Jurisdictional Areas with Development Plan

(Plan obtained from Hunsaker & Assoc. Irvine, Inc., 2021)

Menifee Assemblage, TT 31194
City of Menifee, California

4.0) URBAN WILDLANDS INTERFACE ANALYSIS

The Project proposes an Avoidance/Compatible Use Area along the riparian area on the site as well as an Open Space Area in the northeast corner of the site. An Urban Wildlands Interface Analysis is included here in case the MSHCP requires implementation of the Urban Wildlands Interface Guidelines (Section 6.1.4 of the MSHCP). If these areas are not conserved and/or the Urban Wildlands Interface Guidelines are not applicable, this section will be withdrawn.

The main portion of the Avoidance/Compatible Use Area will be a channel about five (5) feet deep with 4:1 slopes. At the south end is a smaller portion that will be contoured as a basin about five (5) feet deep with 4:1 slopes. Offsite flows from the south will be picked up by v-ditches along the tract boundary and the ditches will convey the flows to this basin. Water will flow from the basin underneath an internal street and into the main portion of the Avoidance/Compatible Use Area through a box culvert. The Avoidance/Compatible Use Area will retain native riparian habitat.

The Avoided Area and Open Space Area will be owned and maintained by the Homeowners Association (HOA) according to HOA guidelines.

4.1) Drainage

Runoff from the development will be treated in water quality basins to remove common pollutants and reduce peak flows before being discharged into the Avoidance/Compatible Use Area.

During construction, all contractors and subcontractors will use Best Management Practices (BMPs) to manage, capture, control, eliminate, and prevent sediment, debris, and pollutants from being discharged into streambeds and drainages. A Storm Water Pollution Prevention Plan (SWPPP) has been prepared for the Project. Construction BMPs address sediment and erosion control, non-sediment pollutants, and non-storm water BMPs.

If grading occurs when the ephemeral streambed is wetted, a bypass will be required. A Bypass Plan will be developed by the SWPPP consultant prior to initiation of grading unless all grading can occur when the ephemeral streambed is dry.

Post-construction BMPs include minimizing urban runoff, minimizing the impervious footprint, conserving natural areas, and minimizing Directly Connected Impervious Areas (DCIAs). Project plans incorporate BMPs to address water quality in low flows and first flush storm runoff,

as well as to control post-construction peak flow volumes. These BMPs will include a combination of water quality, detention, infiltration and/or sand filter basins as needed to adequately treat runoff.

4.2) Toxics

Land uses proposed that use chemicals that are potentially toxic, or that may adversely affect wildlife species, habitat, or water quality shall incorporate measures to ensure that application of such chemicals does not result in discharge to the Avoidance/Compatible Use Area and downstream drainages. The greatest risk is from landscaping fertilizer and herbicide/pesticide runoff. The water quality basins, as discussed above, will reduce expected runoff of toxic chemicals entering the wetland area and adjoining drainages downstream.

Information will be distributed to homeowners in an educational package requesting minimal application of chemicals to yards and prevention of runoff through adjustment of sprinklers to prevent overwatering and overspray resulting in nuisance water and low flow dry season urban runoff.

Signage will be placed on storm drains throughout the community stating: “Nothing but rain in the drains.” Information on the importance of not dumping chemicals, animal waste, and debris into the street will be distributed to homeowners via the Home Owners Association (HOA) at the point of sale or by the managing authority.

4.3) Fencing

The siting and design of fencing should not impede wildlife movement. Given the location of the Avoidance/Compatible Use Area within the residential development, wildlife using the site are likely to be common species that are comfortable with proximity to human disturbance.

The Project boundary and back and side yards will be fenced according to a fencing plan approved by the lead agency. No direct access between residences and the Open Space Area or the Avoidance/Compatible Use Area will occur or be allowed.

Mitigation Measure 4.3-7 in the 2006 EIR requires individual lot fencing to be used to restrict access to the on-site wetland areas. Back yard gates from individual residential lots that open onto the wetland area shall be prohibited.

4.4) Barriers

Proposed land uses adjacent to the Avoidance/Compatible Use Area and Open Space Area shall incorporate barriers in Project designs, where appropriate, to minimize unauthorized public access, domestic animal predation, illegal trespass, or trash dumping. Such barriers may include native landscaping, rocks/boulders, fencing, walls, signage, and/or other appropriate mechanisms.

The Project will install two (2) or more information boards (to be located at each end of the Avoidance/Compatible Use Area and at other access points, as needed) providing a description of suitable uses and asking residents to remain on existing trails and to keep pets on a leash.

4.5) Lighting

Night lighting shall be directed away from the Avoidance/Compatible Use Area and Open Space Area to protect species from direct night lighting. Shielding shall be incorporated in Project designs to ensure ambient lighting in the Avoidance/Compatible Use Area and Open Space Area is not substantially increased.

Mitigation Measure 4.3-8 in the 2006 EIR requires that night lighting during and after project construction shall be directed away from onsite wetland areas and, except for safety and other requirements, lighting shall be limited from the boundaries of onsite wetland areas. In the event that lighting in an area adjacent to the wetland area is necessary, a shield shall be incorporated in Project designs to ensure ambient lighting in the wetland area is not increased.

4.6) Noise

Proposed noise-generating land uses affecting the Avoidance/Compatible Use Area and Open Space Area shall incorporate setbacks, berms, or walls to minimize the effects of noise on wildlife resources pursuant to applicable rules, regulations, and guidelines related to land use noise standards.

4.7) Invasives

Invasive species (refer to MSHCP Table 6-2, below) shall not be used in development or restoration plan activities. Mitigation Measure 4.3-9 in the 2006 EIR requires that the landscape plans for the Project in areas adjacent or tributary to wetland areas shall not include those species listed in the MSHCP as “Plants That Should Be Avoided Adjacent to The MSHCP Conservation Area” (MSHCP Table 6-2).

4.8) Grading/Land Development

Manufactured slopes will be required to extend into the Avoidance/Compatible Use Area to support the Project design. Grading should not extend into the Open Space Area.

4.9) Weed Abatement/Fuel Modification

Weed abatement and fuel modification zones were considered in the determination of habitat impacts. Weed abatement and fuel modification zone would not encroach into portions of the Open Space Area and have been excluded from the Avoidance/Compatible Use Area.

MSHCP Table 6-2. Plants That Should Be Avoided Adjacent to the MSHCP Conservation Area (Taken Directly from MSHCP Section 6.1.4)

BOTANICAL NAME	COMMON NAME
Acacia spp. (all species)	acacia
Achillea millefolium var. *millefolium*	common yarrow
Ailanthus altissima	tree of heaven
Aptenia cordifolia	red apple
Arctotheca calendula	cape weed
Arctotis spp. (all species & hybrids)	African daisy
Arundo donax	giant reed or arundo grass
Asphodelus fistulosus	asphodel
Atriplex glauca	white saltbush
Atriplex semibaccata	Australian saltbush
Carex spp. (all species*)	sedge
Carpobrotus chilensis	ice plant
Carpobrotus edulis	sea fig
Centranthus ruber	red valerian
Chrysanthemum coronarium	annual chrysanthemum
Cistus ladanifer (incl. hybrids/varieties)	gum rockrose
Cortaderia jubata [*syn.C. Atacamensis*]	jubata grass, pampas grass
Cortaderia dioica [syn. *C. sellowana*]	pampas grass
Cotoneaster spp. (all species)	cotoneaster
Cynodon dactylon (incl. hybrids varieties)	Bermuda grass
Cyperus spp. (all species*)	nutsedge, umbrella plant
Cytisus spp. (all species)	broom
Delosperma 'Alba'	white trailing ice plant
Dimorphotheca spp. (all species)	African daisy, Cape marigold
Drosanthemum floribundum	rosea ice plant
Drosanthemum hispidum	purple ice plant
Eichhornia crassipes	water hyacinth
Elaegnus angustifolia	Russian olive
Eucalyptus spp. (all species)	eucalyptus or gum tree
Eupatorium coelestinum [syn. *Ageratina* sp.]	mist flower
Festuca arundinacea	tall fescue
Festuca rubra	creeping red fescue
Foeniculum vulgare	sweet fennel
Fraxinus uhdei (and cultivars)	evergreen ash, shamel ash
Gaura (spp.) (all species)	gaura
Gazania spp. (all species & hybrids)	gazania
Genista spp. (all species)	broom
Hedera canariensis	Algerian ivy
Hedera helix	English ivy
Hypericum spp. (all species)	St. John's Wort
Ipomoea acuminata	Mexican morning glory
Lampranthus spectabilis	trailing ice plant
Lantana camara	common garden lantana
Lantana montevidensis [syn. *L. sellowiana*]	lantana
Limonium perezii	sea lavender
Linaria bipartita	toadflax
Lolium multiflorum	Italian ryegrass
Lolium perenne	perennial ryegrass
Lonicera japonica (incl. 'Halliana')	Japanese honeysuckle
Lotus corniculatus	birdsfoot trefoil

MSHCP Table 6-2. Plants That Should Be Avoided Adjacent to the MSHCP Conservation Area (Continued)

BOTANICAL NAME	COMMON NAME
Lupinus arboreus	yellow bush lupine
Lupinus texanus	Texas blue bonnets
Malephora crocea	ice plant
Malephora luteola	ice plant
Mesembryanthemum nodiflorum	little ice plant
Myoporum laetum	myoporum
Myoporum pacificum	shiny myoproum
Myoporum parvifolium (incl. 'Prostratum')	ground cover myoporum
Oenothera berlandieri	Mexican evening primrose
Olea europea	European olive tree
Opuntia ficus-indica	Indian fig
Osteospermum spp. (all species)	trailing African daisy, African daisy,
Oxalis pes-caprae	Bermuda buttercup
Parkinsonia aculeata	Mexican palo verde
Pennisetum clandestinum	Kikuyu grass
Pennisetum setaceum	fountain grass
Phoenix canariensis	Canary Island date palm
Phoenix dactylifera	date palm
Plumbago auriculata	cape plumbago
Polygonum spp. (all species)	knotweed
Populus nigra 'italica'	Lombardy poplar
Prosopis spp. (all species*)	mesquite
Ricinus communis	castorbean
Robinia pseudoacacia	black locust
Rubus procerus	Himalayan blackberry
Sapium sebiferum	Chinese tallow tree
Saponaria officinalis	bouncing bet, soapwart
Schinus molle	Peruvian pepper tree, California pepper
Schinus terebinthifolius	Brazilian pepper tree
Spartium junceum	Spanish broom
Tamarix spp. (all species)	tamarisk, salt cedar
Trifolium tragiferum	strawberry clover
Tropaelolum majus	garden nasturtium
Ulex europaeus	prickly broom
Vinca major	periwinkle
Yucca gloriosa	Spanish dagger

An asterisk (*) indicates some native species of the genera exist that may be appropriate.

Sources: California Exotic Pest Plant Council, United States Department of Agriculture-Division of Plant Health and Pest Prevention Services, California Native Plant Society, *Fremontia* Vol. 26 No. 4, October 1998, *The Jepson Manual: Higher Plants of California*, and County of San Diego Department of Agriculture.

5.0) SUMMARY AND RECOMMENDATIONS

The purpose of this study was to identify biological resources present or potentially present on the site. The MSHCP requires a habitat assessment to address riparian/riverine and vernal pool habitats and associated species and burrowing owl. Focused surveys are required if suitable habitat is present.

L&L also analyzed the potential for impacts to state and federal jurisdictional waters, special status species, and sensitive vegetation communities. The recommendations are based on the literature review, L&L's knowledge of species and habitats in the region, the biological field survey, and analysis of aerial images.

MSHCP

The site is located within the area covered by the MSHCP but is not within the Criteria Area. There is one area of PQP Conserved Lands approximately 0.68 miles north-northeast of the site (Ringing Rock Archaeological Site). There are no other PQP or MSHCP Conserved Lands within a mile of the site. The site is not within or near any MSHCP Core Areas or Linkages.

Sensitive Vegetation Communities

The site is composed of agricultural lands and disturbed/ruderal areas, California buckwheat scrub, chamise chaparral, arroyo willow thickets, and mulefat thickets. Arroyo willow thickets and mulefat thickets are riparian vegetation communities and arroyo willow thicket is considered sensitive. The majority of arroyo willow thicket will be retained in the Avoidance/Compatible Use Area.

Listed and Special Status Plant Species

No state or federally listed plants were observed during surveys and the Project site is not within USFWS designated critical habitat for any listed plant species. Two special status plant species were observed on the site during surveys, long-spined spineflower and southern California black walnut. Both are covered species under the MSHCP and considered adequately conserved.

Trees

There is a single immature coast live oak tree present on the site within the riparian area. Other native and non-native trees are also present. The City may regulate removal or replacement of trees and a tree survey may be required.

Listed and Fully Protected Wildlife Species

Surveys detected two listed or fully protected wildlife species on the site, coastal California gnatcatcher and white-tailed kite.

Multiple surveys from 2004 through 2021 have documented coastal California gnatcatchers on the Project site, including observations of breeding pairs and nesting. All observations were in the California buckwheat scrub habitat in the northeastern portion of the site. Under Mitigation Measure 4.3-1 of the 2006 EIR, the northeastern portion of the property shall be preserved as open space and covered by a conservation easement or similar mechanism. Coastal California gnatcatcher is a covered species under the MSHCP and considered adequately conserved. Focused surveys for this species are not required under the MSHCP. Scheduling Project activities outside the nesting season and/or conducting preconstruction nesting bird clearance surveys and establishing avoidance buffers around any active nests is recommended, as described below. Monitoring of active nest sites during Project activities is recommended.

Two white-tailed kites were observed on the Project site in 2005 and one in 2011. No kites have been observed during more recent surveys. Although this species may forage on the Project site and potentially suitable nesting habitat is present, no nesting has been observed there. White-tailed kite is a covered species under the MSHCP and considered adequately conserved.

Under Mitigation Measure 4.3-5 of the 2006 EIR, if construction activities occur between January 1 and September 15 and within 150 feet of suitable nesting locations, a focused raptor survey will be required prior to issuance of grading permits. If active nests are located within the portion of the site to be disturbed or within 150 feet of the area to be disturbed, measures shall be initiated to avoid any impacts to nesting raptors, including avoidance buffers around active nests. Under this mitigation measure, if white-tailed kite nesting is found on the Project site, an incidental take permit from CDFW is required.

Two other listed species have not been observed on the Project site during surveys but have a moderate or high potential to occur, Stephens' kangaroo rat and tricolored blackbird (foraging).

Stephens' kangaroo rat is a covered species under the MSHCP and considered adequately conserved. Focused trapping surveys for this species are not required by the MSHCP. Tricolored blackbird is also a covered species under the MSHCP and considered adequately conserved.

Fairy Shrimp

Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys. No fairy shrimp or potential fairy shrimp habitat was observed during current or previous surveys.

Riparian Birds

No least Bell's vireo, southwestern willow flycatcher, or western yellow-billed cuckoo have been incidentally detected during surveys. Riparian vegetation onsite is scattered and degraded, the understory is poorly developed, and the streambed does not have persistent water flow. Typical habitat to support least Bell's vireo, southwestern willow flycatcher, and yellow-billed cuckoo is not present and these species are considered absent from the site.

Quino Checkerspot Butterfly

No Quino checkerspot butterfly adults, larvae, or pupae were observed onsite during focused surveys in 2004, although potentially suitable habitat and larval host and nectaring plants are present. This species has not been incidentally observed during any subsequent surveys. Quino checkerspot butterfly is a covered species under the MSHCP and considered adequately conserved. Focused surveys are not required by the MSHCP.

Special Status Wildlife Species

Biological surveys from 2003 to 2021 detected 19 special status wildlife species on the site: orange-throated whiptail, coastal (western) whiptail, coast horned lizard, Cooper's hawk, southern California rufous-crowned sparrow, great egret, great blue heron (fly over), Bell's sage sparrow, burrowing owl, Costa's hummingbird, wrentit, northern harrier, Nuttall's woodpecker, California horned lark, loggerhead shrike, rufous hummingbird, Lawrence's goldfinch, California thrasher, and San Diego black-tailed jackrabbit.

All of these species are covered under the MSHCP and considered adequately conserved, with the exception of great egret, Costa's hummingbird, wrentit, Nuttall's woodpecker, rufous

hummingbird, Lawrence's goldfinch, and California thrasher, which are not covered under the MSHCP. Burrowing owl is discussed below. Scheduling Project activities outside the nesting season or conducting preconstruction nesting bird clearance surveys and establishing avoidance buffers around any active nests is recommended, as described below.

Five (5) additional special status wildlife species have not been observed on the Project site during L&L surveys but have a low to moderate potential to occur. These species are Crotch bumble bee, southern California legless lizard, Dulzura pocket mouse, northwestern San Diego pocket mouse, and western mastiff bat (foraging). Northwestern San Diego pocket mouse is covered under the MSHCP and considered adequately conserved. The remaining four species are not covered under the MSHCP.

Crotch bumble bee was previously a candidate for state listing, but in November 2020 the Sacramento Superior Court ruled that insects are not eligible for listing under the California Endangered Species Act. The California Fish and Game Commission filed an intent to appeal this decision in February 2021. The status of this species may be affected by subsequent litigation or changes to regulations. If Crotch bumble bee becomes a listed or candidate species, focused surveys and incidental take permitting may be required.

Burrowing Owl

One (1) adult burrowing owl and an occupied burrow were observed onsite in 2018. No owls or owl sign were observed in 2019 or 2021. Because suitable habitat is present, the MSHCP requires a preconstruction clearance survey for burrowing owl within 30 days prior to the start of site disturbance. If burrowing owls are found on the site at that time, additional mitigation is required under the MSHCP and Mitigation Measure 4.3-2 of the 2006 EIR.

Nesting Birds

There is habitat suitable for nesting birds (including raptors) within and adjacent to the site. Nesting birds may utilize trees, shrubs, and other vegetation, and open ground on and adjacent to the site for nesting.

Nesting birds are protected under state and federal laws. Project activities, including initial vegetation trimming/clearing, tree trimming/removal, ground disturbance, etc., should be avoided during the nesting season (generally January 1 to September 15). If the nesting season cannot be avoided, a nesting bird clearance survey is recommended within three (3) days prior to the start of Project activities within the nesting season. If active nests are present,

avoidance of nest sites is required and a buffer of 300 to 500 feet (or as determined by a biologist) is recommended until a biologist has verified that juvenile birds are no longer dependent on the nest or the nest has otherwise become inactive. An active nest is defined as a nest with eggs, chicks, or dependent juveniles, or a nest actively being constructed or utilized for reproduction.

Wildlife Corridors

The site is largely surrounded by scattered existing development and there is no connectivity between the site and conserved lands to the east and southwest. Although there may be limited local movement of wildlife on and across the site, it is not within or adjacent to a wildlife corridor or potential corridor.

Jurisdictional Waters/Wetlands and MSHCP Riparian/Riverine and Vernal Pool Habitat

An ephemeral drainage with scattered riparian vegetation is present on the site and mapped as a USGS blue-line stream. A jurisdictional delineation found 0.43 acre of unvegetated state streambed (which is also MSHCP riverine habitat) and 0.93 acre of state wetland (which is also MSHCP riparian habitat). The survey also identified 0.10 acre of federal waters. There is no federal wetland.

All jurisdictional areas onsite will either be impacted by Project development or incorporated into the Avoidance/Compatible Use Area. Areas of the property that cannot be avoided and will be impacted by planned development include 9,541 sq. ft. (0.22 acre) of MSHCP riverine habitat and 5,702 sq. ft. (0.13 acre) of MSHCP riparian habitat. Areas that are avoided by the Project and contain MSHCP riparian/riverine habitat include 9,273 sq. ft. (0.21 acre) of MSHCP riverine habitat and 34,749 sq. ft. (0.80 acre) of MSHCP riparian habitat that will be retained onsite in an Avoidance/Compatible Use Area. Monitoring of Project activities adjacent to the Avoidance/Compatible Use Area is recommended.

Pools or depressions characteristic of vernal habitat were not observed on the site and no wetland or vernal pool plant species were present. No evidence of ponding areas (i.e., cracked soils, tire ruts, etc.) were observed on the site during surveys.

Regulatory permits from USACE, RWQCB, and CDFW will be required for impacts to jurisdictional areas. A DBESP will be required for impacts to MSHCP riparian/riverine habitat. Mitigation Measure 4.3-6 also requires on or off-site replacement of CDFW and federal jurisdictional waters and wetlands at a ratio of no less than 1:1 and incorporation of design

features that will avoid biological impacts to offsite blue-line streams that flow to Canyon Lake. Monitoring of Project activities that disturb vegetation or soil in and adjacent to the Avoidance/Compatible Use Area is recommended.

6.0) REGULATORY ENVIRONMENT

The following summary of the regulatory environment is provided for information purposes and is not intended for review or comment by the lead or wildlife agencies.

6.1) Federal Endangered Species Act

Section 9 of the federal Endangered Species Act (FESA), 1973 (as amended) prohibits "take" of federally listed threatened and endangered species. Candidate species receive no protection under FESA, but the USFWS encourages conservation of these species. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. "Harm" is further defined to include habitat modification or degradation when it actually kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering.

Incidental take is take that results from, but is not the purpose of, carrying out an otherwise lawful activity. Incidental take of federally listed species may be authorized under Section 7 of FESA for federal properties or where federal actions (i.e., federal permitting or federal funding) are involved or under Section 10 of FESA for non-federal actions.

Section 7 requires all Federal agencies, in "consultation" with the USFWS, to ensure that their actions are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat. The Section 7 process requires preparation of a federal Biological Assessment to determine whether a proposed major construction activity under the authority of a Federal action agency is likely to adversely affect listed species, proposed species, or designated critical habitat. After formal consultation, the USFWS will issue a Biological Opinion stating whether or not a federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

Section 10 lays out the guidelines under which a permit may be issued to authorize take of endangered or threatened species (in the absence of any federal nexus). Application for an incidental take permit under Section 10 is subject to certain requirements, including preparation by the permit applicant of a conservation plan, generally known as a "Habitat Conservation Plan" or "HCP." An HCP is a plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect species. The plan usually includes measures to minimize

impacts, such as provisions for permanently protecting land, restoring habitat, and relocating plants or animals to another area.

6.2) Jurisdictional Waters and Wetlands

Three agencies generally regulate activities within streams, wetlands, and riparian areas in California: (1) the U.S. Army Corps of Engineers (USACE) regulates activities under Section 404 of the federal Clean Water Act; (2) the Regional Water Quality Control Board (RWQCB) regulates activities under Section 401 of the federal Clean Water Act and the State Porter-Cologne Water Quality Control Act; and (3) the California Department of Fish and Wildlife (CDFW) regulates activities under California Fish and Game Code Sections 1600-1616.

6.2.1) Federal Clean Water Act, Section 404

Section 404 of the federal Clean Water Act applies to "Waters of the United States" (WoUS). By definition these include waterways that could be used for interstate commerce and their tributaries, including any waters that flow into traditional navigable waters. In non-tidal waters, the limits of jurisdiction are "ordinary high water marks" (OHWM) such as stream banks.

There have been recent changes to the definition of WoUS and the agencies are interpreting WoUS consistent with the pre-2015 regulatory regime until further notice. Under this rule, WoUS includes:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters including interstate wetlands;

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

    a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

    b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

c. Which are used or could be used for industrial purposes by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States under this definition;

5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;

6. The territorial sea;

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Final determination and delineation of federal jurisdiction is made by the USACE and not by the project biologists. Therefore, fieldwork and documentation of the site conditions are done as a preliminary delineation until the USACE reviews and concurs with the results.

6.2.2) Federal Clean Water Act, Section 401 and Porter-Cologne

The RWQCB has jurisdiction over wetlands, WoUS, and Waters of the State under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne) under the California Water Code (§ 13000, et seq.) Permitting is required for activities that will result in a discharge of soils, nutrients, chemicals, detrital materials, or other pollutants into WoUS, Waters of the State, or adjacent wetlands that will affect the water quality of those bodies and the watershed.

6.2.3) California Fish and Game Code, Section 1600

The CDFW, through provisions of the California Fish and Game Code (Sections 1600-1616), is empowered to issue agreements ("Lake and Streambed Alteration Agreements") for projects that will adversely affect wildlife habitat associated with any river, stream, or lake edges. The Lake and Streambed Alteration Agreement will typically include required measures to mitigate impacts.

Sections 1600-1616 of the California Fish and Game Code apply to stream channels, defined elsewhere in the Code as follows:

"A stream is a body of water that flows at least periodically through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

The state definition does not specify a flow rate or inundation frequency and provides no clear distinction between jurisdictional and non-jurisdictional lands.

While the federal USACE criteria (hydrology, soils, and vegetation) are used to evaluate the presence or absence of wetlands within the project site, the determination of state wetland status is not based on the combined presence of the three criterion because the state can take jurisdiction of any one of the three: (1) the presence of open water or saturated soils, (2) presence of vegetation including riparian or wetland species, and/or (3) water-modified or oxygen-depleted soils.

6.3) California Endangered Species Act

California Endangered Species Act (CESA) definitions of endangered and threatened species parallel those defined in the FESA. The CESA defines an endangered species as ". . . a native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes including loss of habitat, change in habitat, over exploitation, predation, competition or disease." Endangered species are in serious danger of becoming extinct and threatened species are likely to become endangered species in the foreseeable future (according to Sections 2062 and 2067, respectively, of the California Fish and Wildlife Code). Candidate species are those under formal review by the CDFW for listing as endangered or threatened (Section 2067). Prior to being considered for protected status, the CDFW designates a species as being of special concern. Species of Special Concern are those for which the CDFW has information indicating population decline.

6.4) California Environmental Quality Act

The California Environmental Quality Act (CEQA) and CEQA Guidelines (§ 15000 et seq.) require identification of environmental effects from discretionary projects. Significant effects are to be mitigated by avoidance, minimization, rectification, or compensation whenever possible.

Effects to all state and federal listed species are considered significant under CEQA. In addition to formally listed species, CEQA considers effects to species that are demonstrably endangered or rare as important or significant. These definitions can include state designated species of

special concern, federal candidate and proposed species, California Natural Diversity Database (CNDDB) tracked species, and California Rare Plant Rank (CRPR) 1B and 2 plants.

Appendix G of the CEQA Guidelines specifically addresses biological resources and encompasses a broad range of resources to be considered.

6.5) California Natural Diversity Database

The California Natural Diversity Database (CNDDB) is a database that ranks overall condition of listed and special status species and sensitive vegetation communities on global (throughout its range) and state (within California) levels. The CNDDB includes documented occurrences of listed and special status species that have been reported to CDFW. State ranking is numerical, ranging from one to five (S1 to S5), with one indicating very few remaining individuals or little remaining habitat and five indicating a demonstrably secure to ineradicable population condition. State ranks (S ranks) may also include an extension (e.g., S1.x) indicating current threats ranging from one (very threatened) to three (no current threats known).

6.6) California Rare Plant Rank

The California Native Plant Society (CNPS) Inventory of Rare and Endangered Species includes documented occurrences of special status plant species that are available through the Consortium of California Herbaria and other sources. The CNPS, in coordination with CDFW, has cataloged California's rare and endangered plants into lists according to population distributions and viability. These lists are numbered and indicate the following California Rare Plant Ranks (CRPR): (1A) presumed extinct in California; (1B) rare, threatened, or endangered throughout their range; (2A) presumed extirpated in California, but more common in other states; (2B) threatened or endangered in California, but more common in other states; (3) more information is needed to establish rarity; and (4) plants of limited distribution in California (i.e., naturally rare in the wild), but whose populations do not appear to be susceptible to threat. A CRPR may also have an extension (e.g., 1B.x) that indicates current level of threat: seriously threatened (x.1), moderately threatened (x.2), or not very threatened (x.3).

6.7) Information for Planning and Consultation

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) is a database that includes federally listed endangered or threatened species and species proposed for listing, designated critical habitat, Birds of Conservation Concern, and other federally regulated lands and biological resources.

6.8) Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711) is an international treaty that made it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Executive Order 13186 ensures that environmental analyses of federal actions required by the National Environmental Policy Act (NEPA) or other established environmental review processes evaluate the effects of actions on migratory birds, with emphasis on species of concern. Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) or loss of habitat upon which the birds depend could be considered "take."

6.9) California Fish and Game Code, Sections 3503 and 3513

California Fish and Game Code Section 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; Section 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and Section 3513 provides for the adoption of the provisions of the federal Migratory Bird Treaty Act, described above.

6.10) Western Riverside County Multiple Species Habitat Conservation Plan

The County of Riverside, including eight (8) additional land jurisdictions and 14 cities, have prepared a Multiple Species Habitat Conservation Plan (MSHCP) for western Riverside County. The MSHCP will build upon existing preserves and provide connectivity and wildlife corridors throughout the region. The MSHCP proposes to conserve approximately 500,000 acres and 146 different species.

The MSHCP was approved by the county on June 17, 2003 and an Implementation Agreement (IA) between the USFWS, the CDFW, and the County was executed and an associated USFWS Section 10(a)(1)(B) Permit (No. TE-088609) was issued on June 22, 2004. The permit grants take authorization for certain species identified in the permit as "Covered Species Adequately Conserved."

The MSHCP establishes seven (7) core reserve areas and associated linkages between proposed and existing core areas. The MSHCP divides these areas into Cells using USGS coordinates.

Focused surveys are required for species identified as not adequately conserved under the MSHCP if suitable habitat is present onsite. If focused surveys are determined necessary and species identified as not adequately conserved under the MSHCP occur onsite, the proponent may be required to undergo a Habitat Acquisition and Negotiation Strategy (HANS) determination with the County of Riverside. If a single-family home or mobile home is to be placed on an existing legal lot, permitting will be reviewed according to the procedures outlined in MSHCP Section 6.1.1, *Expedited Review Process for Single-Family Homes or Mobile Homes to Be Located on an Existing Lot within the Criteria Area*.

MSHCP Section 6.1.2 (Riparian/Riverine Habitat)

Section 6.1.2 of the MSHCP requires an assessment of the potentially significant effects of the proposed project on Riparian/riverine areas, and vernal pools as currently required by CEQA using available information augmented by project-specific mapping. Riparian/riverine areas and vernal pools are defined as follows:

- Riparian/riverine Areas are lands that have flow for all or a portion of the year and which contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year.

- Vernal pools are seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. The determination that an area exhibits vernal pool characteristics, and the definition of the watershed supporting vernal pool hydrology, must be made on a case-by case basis. Such determinations should consider the length of the time the area exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soils, and drainage characteristics, uses, to which it has been subjected, and weather and hydrologic records.

With the exception of wetlands created for the purpose of providing wetlands habitat or resulting from human actions to create open waters or from the alteration of natural stream courses, areas demonstrating characteristics as described above which are artificially created are not included in these definitions.

Burrowing Owl

Section B (Species Accounts) of Volume 2 of the MSHCP (Dudek 2003) lists the following objectives for burrowing owl conservation/protection:

Objective 1

Include within the MSHCP Conservation Area at least 27,470 acres of suitable primary habitat for the burrowing owl including grasslands.

Objective 2

Include within the MSHCP Conservation Area at least 5 Core Areas and interconnecting linkages. Core areas may include the following: (1) Lake Skinner/Diamond Valley Lake area (Existing Core C plus Proposed Extension of Existing Cores 5, 6, 7; 29,060 acres); (2) playa west of Hemet (Proposed Noncontiguous Habitat Block 7; 1,250 acres); (3) San Jacinto Wildlife Area/Mystic Lake area including Lake Perris area (Existing Core H; 17,470 acres); (4) Lake Mathews (Existing Core C plus Proposed Extension of Existing Cores 2; 23,710 acres); and (5) along the Santa Ana River (9,670 acres). The Core Areas should support a combined total breeding population of approximately 120 burrowing owls with no fewer than five pairs in any one Core area.

Objective 3

Include within the MSHCP Conservation Area at least 22,120 acres of suitable secondary habitat for the burrowing owl including playas and vernal pools, and agriculture outside of the Core Areas identified above. Areas where additional suitable habitat could be conserved include west of the Jurupa Mountains, near Temescal Wash (i.e., vicinity of Alberhill), near Temecula Creek, within the Lakeview Mountains, Banning, the Badlands, Gavilan Hills, and Quail Valley.

Objective 4

Include within the MSHCP Conservation Area the known nesting locations of the burrowing owl at Lake Perris, Mystic Lake/San Jacinto Wildlife area, Lake Skinner area, the area around Diamond Valley Lake, playa west of Hemet, Lakeview Mountains, Lake Mathews/Estelle Mountain Reserve and Sycamore Canyon Regional Park.

Objective 5

Surveys for burrowing owl will be conducted as part of the project review process for public and private projects within the burrowing owl survey area where suitable habitat is present (see Burrowing Owl Survey Area Map, Figure 6-4 of the MSHCP, Volume I). The locations of this species determined as a result of survey efforts shall be conserved in accordance with procedures described within Section 6.3.2, MSHCP, Volume I and the guidance provided below:

Burrowing owl surveys shall be conducted utilizing accepted protocols as follows. If burrowing owls are detected on the project site then the action(s) taken will be as follows:

If the site is within the Criteria Area, then at least 90 percent of the area with long-term conservation value will be included in the MSHCP Conservation Area. Otherwise:

1) If the site contains, or is part of an area supporting less than 35 acres of suitable habitat or the survey reveals that the site and the surrounding area supports fewer than 3 pairs of burrowing owls, then the on-site burrowing owls will be passively or actively relocated following accepted protocols.

2) If the site (including adjacent areas) supports three or more pairs of burrowing owls, supports greater than 35 acres of suitable habitat and is non-contiguous with MSHCP Conservation Area lands, at least 90 percent of the area with long-term conservation value and burrowing owl pairs will be conserved onsite.

The survey and conservation requirements stated in this objective will be eliminated when it is demonstrated that Objectives 1 – 4 have been met.

Objective 6

Pre-construction presence/absence surveys for burrowing owl within the survey area where suitable habitat is present will be conducted for all Covered Activities through the life of the permit. Surveys will be conducted within 30 days prior to disturbance. Take of active nests will be avoided. Passive relocation (use of one-way doors and collapse of burrows) will occur when owls are present outside the nesting season.

Objective 7

Translocation sites for the burrowing owl will be created in the MSHCP Conservation Area for the establishment of new colonies. Translocation sites will be identified, taking into consideration unoccupied habitat areas, presence of burrowing mammals to provide suitable burrow sites, existing colonies and effects to other Covered Species. Reserve Managers will consult with the Wildlife Agencies regarding site selection prior to translocation site development.

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APPENDIX A: PLANT AND WILDLIFE SPECIES

Plant and wildlife species identified on the Golden Meadows site during surveys from 2003 to 2021. One asterisk (*) indicates a non-native species; two asterisks (**) indicates a special status species; a question mark (?) indicates uncertainty regarding identification or native status. The list includes common butterfly species that were observed during Quino checkerspot butterfly surveys in 2004 but does not represent a complete inventory of insects present.

	Scientific Name	**Common Name**
	VASCULAR PLANTS	
	DICOTYLEDONS	
	ADOXACEAE	MUSKROOT FAMILY
	Sambucus nigra ssp. cerulea (S. mexicana)	Mexican elderberry, blue elderberry
	AMARANTHACEAE	AMARANTH FAMILY
*	*Amaranthus albus*	Tumbleweed, tumbling pigweed
	ANACARDIACEAE	SUMAC or CASHEW FAMILY
*	*Schinus molle*	Peruvian pepper tree
	APIACEAE	CELERY FAMILY
	Daucus pusillus	Rattlesnake weed, wild carrot
	ASTERACEAE	ASTER FAMILY
	Acourtia microcephala (Perezia microcephala)	Scapellote, perezia
	Ambrosia acanthicarpa	Annual bur-sage, annual sandbur
*	*Anthemis cotula*	Mayweed, dog mayweed
	Artemisia californica	California sagebrush
	Baccharis salicifolia (B. glutinosa)	Mulefat
	Bebbia juncea	Sweetbush
*	*Centaurea melitensis*	Tocalote
	Chaenactis artemisiifolia	White pincushion, wormwood pincushion
	Corethrogyne filaginifolia var. filaginifolia (Lessingia filaginifolia)	California-aster, sand-aster
	Deinandra fasciculata (Hemizonia fasciculata)	Fascicled tarplant, slender tarweed
	Encelia farinosa	Brittlebush
*	*Erigeron bonariensis (Conyza bonariensis)*	Flax-leaved horseweed
	Erigeron canadensis (Conyza canadensis)	Horseweed, mare's tail
	Eriophyllum confertiflorum	Golden-yarrow

	Scientific Name	**Common Name**
	Eriophyllum multicaule	Many-stem woolly daisy
	Gutierrezia californica (G. bracteata)	California matchweed
	Helianthus annuus	Western sunflower
	Helianthus gracilentus	Slender sunflower
*	*Lactuca serriola*	Prickly lettuce
	Lasthenia californica (L. chrysostoma)	California goldfields
	Layia platyglossa	Tidy-tips
	Logfia filaginoides (Filago californica)	California filago
*	*Matricaria discoidea (Chamomilla suaveolens, M. matricarioides)*	Pineapple weed
*	*Oncosiphon pilulifer (Matricaria globosa)*	Stinknet
	Rafinesquia californica	California chicory
*	*Senecio vulgaris*	Common groundsel
*	*Sonchus oleraceus*	Common sow thistle
	Stephanomeria virgata	Wreath plant
	Stylocline gnaphaloides	Everlasting neststraw
	Tetradymia comosa	Hairy horsebrush, common-thorn
	Uropappus lindleyi (Microseris lindleyi, M. linearifolia)	Silverpuffs
*?	*Xanthium spinosum*	Spiny cocklebur
	BORAGINACEAE	BORAGE OR WATERLEAF FAMILY
	Amsinckia intermedia (A. menziesii var. intermedia)	Large flower rancher's fiddleneck
	Cryptantha species	Unid. cryptantha
	Cryptantha intermedia	Common cryptantha
	Heliotropium curassavicum	Wild heliotrope
	Pectocarya linearis	Slender pectocarya
	Phacelia minor	Wild Canterbury bells
	Phacelia ramosissima	Branching phacelia
	Plagiobothrys species	Popcornflower
	BRASSICACEAE	MUSTARD FAMILY
*	*Brassica nigra*	Black mustard
*	*Hirschfeldia incana (Brassica geniculata)*	Shortpod mustard
	Lepidium nitidum	Shining peppergrass
*	*Raphanus sativus*	Wild radish
*	*Sisymbrium irio*	London rocket
*	*Sisymbrium orientale*	Wild mustard, hare's ear cabbage
	Thysanocarpus curvipes	Fringepod

	Scientific Name	**Common Name**
	CACTACEAE	CACTUS FAMILY
	Cylindropuntia californica var. parkeri (Opuntia parryi)	Valley cholla
	CHENOPODIACEAE	GOOSEFOOT FAMILY
*	*Atriplex suberecta*	Sprawling saltbush, Australian saltbush
*	*Chenopodium murale*	Nettle-leaved goosefoot, lamb's quarters
*	*Salsola tragus*	Russian thistle
	CONVOLVULACEAE	MORNING-GLORY FAMILY
	Calystegia macrostegia	Morning-glory
	Cuscuta californica	Chaparral dodder, witch's hair
	CRASSULACEAE	STONECROP FAMILY
	Crassula connata (C. erecta)	Pygmy-weed, pygmy stonecrop
	CUCURBITACEAE	GOURD FAMILY, CUCUMBER FAMILY
	Cucurbita foetidissima	Calabazilla
	Marah macrocarpa	Chilicothe, wild cucumber
	EUPHORBIACEAE	SPURGE FAMILY
	Croton setiger (C. setigerus, Eremocarpus setiger, E. setigerus)	Turkey-mullein, doveweed
	Euphorbia albomarginata (Chamaesyce albomarginata)	Rattlesnake sandmat, rattlesnake weed
	FABACEAE	LEGUME FAMILY, PEA FAMILY
	Acmispon americanus (Lotus purshianus, L. unifoliatus)	"Spanish" clover
	Acmispon glaber (Lotus scoparius)	Deerweed
	Lupinus species	Unid. lupine
	Lupinus bicolor	Miniature lupine, dove lupine
*	*Medicago polymorpha*	California burclover
*	*Vicia villosa*	Winter vetch
	FAGACEAE	OAK FAMILY
	Quercus agrifolia	Coast live oak
	GERANIACEAE	GERANIUM FAMILY
*	*Erodium botrys*	Long-beak filaree
*	*Erodium cicutarium*	Redstem filaree
	JUGLANDACEAE	WALNUT FAMILY
**	*Juglans californica*	Southern California black walnut

	Scientific Name	**Common Name**
	LAMIACEAE	MINT FAMILY
*	*Lamium amplexicaule*	Common henbit
*	*Marrubium vulgare*	Horehound
	Salvia apiana	White sage
	Salvia columbariae	Chia
	Salvia mellifera	Black sage
	Trichostema lanceolatum	Vinegar weed
	MALVACEAE	MALLOW FAMILY
*	*Malva parviflora*	Cheeseweed
	MYRSINACEAE	MYRSINE FAMILY
*	*Lysimachia (Anagallis) arvensis*	Scarlet pimpernel
	MYRTACEAE	MYRTLE FAMILY, EUCALYPTUS FAMILY
*	*Eucalyptus species*	Ornamental eucalyptus, gumtree
	NYCTAGINACEAE	FOUR O'CLOCK FAMILY
	Mirabilis laevis var. crassifolia (M. californica)	Wishbone bush
	ONAGRACEAE	EVENING-PRIMROSE FAMILY
	Camissonia species	Unid. evening-primrose
	Eulobus californica (Camissonia californica)	California false mustard, mustard evening primrose
	PAPAVERACEAE	POPPY FAMILY
	Eschscholzia californica	California poppy
	PHRYMACEAE	LOPSEED FAMILY
	Diplacus (Mimulus) aurantiacus (M. puniceus, M. longiflorus)	Bush monkeyflower, sticky monkeyflower
	Erythranthe (Mimulus) guttatus	Seep monkeyflower
	PLANTAGINACEAE	PLANTAIN FAMILY
	Antirrhinum nuttallianum	Nuttall snapdragon, violet snapdragon
	Keckiella antirrhinoides	Yellow bush-penstemon
	Plantago erecta	California plantain
	POLEMONIACEAE	PHLOX FAMILY
	Eriastrum sapphirinum	Sapphire woollystar
	Navarretia hamata	Hooked navarretia
	POLYGONACEAE	BUCKWHEAT FAMILY
	Chorizanthe fimbriata	Fringed spineflower
**	*Chorizanthe polygonoides var. longispina*	Long-spined spineflower
	Eriogonum fasciculatum var. foliolosum	Leafy California wild buckwheat, interior California buckwheat

	Scientific Name	**Common Name**
	Eriogonum fasciculatum var. polifolium	Mojave Desert California buckwheat
*	*Polygonum aviculare (P. arenastrum)*	Common knotweed
*	*Rumex crispus*	Curly dock
	PORTULACACEAE	PURSLANE FAMILY
*	*Portulaca oleracea*	Common purslane
	ROSACEAE	ROSE FAMILY
	Adenostoma fasciculatum	Chamise
	RUBIACEAE	MADDER FAMILY, COFFEE FAMILY
*?	*Galium aparine*	Goose grass, annual bedstraw
	SALICACEAE	WILLOW FAMILY
	Populus fremontii ssp. fremontii	Fremont cottonwood
	Salix gooddingii	Goodding's black willow
	Salix lasiolepis	Arroyo willow
	SCROPHULARIACEAE	FIGWORT FAMILY, SNAPDRAGON FAMILY
	Scrophularia californica	California figwort, coast figwort
	SOLANACEAE	NIGHTSHADE FAMILY
	Datura wrightii (D. meteloides)	Jimsonweed, tolguacha
*	*Nicotiana glauca*	Tree tobacco
	Solanum americanum (S. nodiflorum)	White nightshade
	TAMARICACEAE	TAMARISK FAMILY
*	*Tamarix species*	Unid. tamarisk
	URTICACEAE	NETTLE FAMILY
*	*Urtica urens*	Dwarf nettle
	ZYGOPHYLLACEAE	CALTROP FAMILY
*	*Tribulus terrestris*	Puncture vine
	MONOCOTYLEDONS	
	AGAVACEAE	CENTURY PLANT FAMILY, AGAVE FAMILY
	Hesperoyucca whipplei (Yucca whipplei)	Chaparral yucca
	LILIACEAE	LILY FAMILY
	Calochortus splendens	Splendid mariposa lily
	POACEAE	GRASS FAMILY
*	*Avena barbata*	Slender wild oat
*	*Avena fatua*	Wild oat

	Scientific Name	**Common Name**
*	*Bromus species*	Non-native brome
*	*Bromus diandrus (B. rigidus)*	Ripgut brome
*	*Bromus rubens (B. madritensis ssp. rubens)*	Red brome
*	*Digitaria sanguinalis*	Hairy crabgrass
*	*Festuca species (Vulpia species)*	Annual fescue
*	*Hordeum murinum*	Wall barley, hare barley
*	*Lamarckia aurea*	Goldentop grass
*	*Phalaris species*	Unid. canary grass
*	*Schismus barbatus*	Mediterranean grass
*	*Triticum aestivum*	Wheat
THEMIDACEAE		BRODIAEA FAMILY
	Dichelostemma capitatum (D. pulchella, Brodiaea pulchella)	Blue dicks, wild hyacinth
	Muilla maritima	Common muilla, rough muilla

	Scientific Name	**Common Name**
	VERTEBRATES	
	Reptiles	
	Colubridae	Colubrid Snakes
	Pituophis catenifer	Gopher snake
	Phrynosomatidae	Spiny Lizards
**	*Phrynosoma blainvillii*	Coast horned lizard
	Sceloporus occidentalis	Western fence lizard
	Sceloporus orcutti	Granite spiny lizard
	Uta stansburiana	Side-blotched lizard
	Teiidae	Teiid Lizards
**	*Aspidoscelis hyperythra*	Orange-throated whiptail
**	*Aspidoscelis tigris stejnegeri*	Coastal (western) whiptail
	Birds	
	Accipitridae	Hawks, Eagles, and Harriers
**	*Accipiter cooperii*	Cooper's hawk
	Buteo jamaicensis	Red-tailed hawk
	Buteo lineatus	Red-shouldered hawk
**	*Circus hudsonius (C. cyaneus)*	Northern harrier
**	*Elanus leucurus*	White-tailed kite
	Aegithalidae	Long-tailed Tits
	Psaltriparus minimus	Bushtit
	Alaudidae	Larks
**	*Eremophila alpestris actia*	California horned lark
	Anatidae	Ducks, Geese, Swans
	Anas platyrhynchos	Mallard (fly over)
	Apodidae	Swifts
	Aeronautes saxatalis	White-throated swift
	Ardeidae	Herons
**	*Ardea alba*	Great egret
**	*Ardea herodias*	Great blue heron (fly over)
	Cardinalidae	Cardinals
	Passerina amoena	Lazuli bunting
	Cathartidae	Vultures
	Cathartes aura	Turkey vulture

Charadriidae		Plovers
	Charadrius vociferus	Killdeer
Columbidae		Pigeons and Doves
*	*Columba livia*	Rock dove, common pigeon
	Zenaida macroura	Mourning dove
Corvidae		Crows and Jays
	Aphelocoma californica	California scrub jay
	Corvus brachyrhynchos	American crow
	Corvus corax	Common raven
Cuculidae		Cuckoos
	Geococcyx californianus	Greater roadrunner
Falconidae		Falcons
	Falco sparverius	American kestrel
Fringillidae		Finches
**	*Spinus (Carduelis) lawrencei*	Lawrence's goldfinch
	Spinus (Carduelis) psaltria	Lesser goldfinch
	Spinus (Carduelis) tristes	American goldfinch
	Haemorhous (Carpodacus) mexicanus	House finch
Hirundinidae		Swallows
	Hirundo rustica	Barn swallow
	Petrochelidon pyrrhonota tachina	Cliff swallow
	Stelgidopteryx serripennis	Northern rough-winged swallow
	Tachycineta thalassina	Violet-green swallow
Icteridae		Blackbirds
	Agelaius phoeniceus	Red-winged blackbird
	Euphagus cyanocephalus	Brewer's blackbird
	Icterus bullockii	Bullock's oriole
	Sturnella neglecta	Western meadowlark
Laniidae		Shrikes
**	*Lanius ludovicianus*	Loggerhead shrike
Mimidae		Mockingbirds
	Mimus polyglottos	Northern mockingbird
**	*Toxostoma redivivum*	California thrasher
Motacillidae		Wagtails and Pipits
	Anthus rubescens	American pipit
Odontophoridae		Quail
	Callipepla californica	California quail

Parulidae		Wood Warblers
	Geothlypis tolmiei	MacGillivray's warbler
	Oreothlypis celata	Orange-crowned warbler
	Setophaga coronata	Yellow-rumped warbler
Passerellidae		New World Sparrows
**	*Aimophila ruficeps canescens*	Southern California rufous-crowned sparrow
**	*Artemisiospiza belli*	Bell's sage sparrow
	Chondestes grammacus	Lark sparrow
	Melospiza melodia	Song sparrow
	Melozone crissalis	California towhee
	Passerculus sandwichensis	Savannah sparrow
	Pipilo maculatus	Spotted towhee
	Pooecetes gramineus	Vesper sparrow
	Spizella passerina	Chipping sparrow
	Zonotrichia leucophrys	White-crowned sparrow
Passeridae		Old World Sparrows
*	*Passer domesticus*	House sparrow
Picidae		Woodpeckers
	Colaptes auratus	Northern flicker
**	*Dryobates (Picoides) nuttallii*	Nuttall's woodpecker
Polioptilidae		Gnatcatchers
	Polioptila caerulea	Blue-gray gnatcatcher
**	*Polioptila californica*	Coastal California gnatcatcher
Strigidae		Owls
**	*Athene cunicularia*	Burrowing owl
Sturnidae		Starlings
*	*Sturnus vulgaris*	European starling
Timaliidae		Babblers
**	*Chamaea fasciata*	Wrentit
Trochilidae		Hummingbirds
	Calypte anna	Anna's hummingbird
**	*Calypte costae*	Costa's hummingbird
**	*Selasphorus rufus*	Rufous hummingbird
Troglodytidae		Wrens
	Catherpes mexicanus	Canyon wren
	Salpinctes obsoletus	Rock wren
	Thryomanes bewickii	Bewick's wren
	Troglodytes aedon	House wren
Turdidae		Thrushes
	Sialia mexicana	Western bluebird

Tyrannidae	Tyrant Flycatchers
Empidonax wrightii	Gray flycatcher
Myiarchus cinerascens	Ash-throated flycatcher
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Tyrannus verticalis	Western kingbird
Tyrannus vociferans	Cassin's kingbird

Mammals

Canidae	Dogs, Foxes, and Coyotes
Canis familiaris	Domestic dog
Canis latrans	Coyote
Geomyidae	Pocket Gophers
Thomomys bottae	Botta's pocket gopher (sign)
Leporidae	Rabbits
** *Lepus californicus bennettii*	San Diego black-tailed jackrabbit
Sylvilagus audubonii	Audubon's cottontail
Sciuridae	Squirrels
Spermophilus beecheyi	California ground squirrel

INVERTEBRATES

Lepidoptera	**Butterflies and Moths**
Papilionidae	Swallowtails
Papilio rutulus	Western tiger swallowtail
Papilio zelicaon	Anise swallowtail
Nymphalidae	Brush-footed butterflies
Euphydryas chalcedona	Chalcedon checkerspot
Junonia coenia	Buckeye
Vanessa cardui	Painted lady
Vanessa annabella	West coast lady
Vanessa virginiensis	Virginia lady
Lycaenidae	Blues, Hairstreaks, Coppers
Glaucopsyche lygdamus australis	Southern blue
Icaricia acmon	Acmon blue
Pieridae	Whites and Sulfurs
Anthocharis sara	Sara orange-tip
Anthocharis cethura	Felder's orange-tip
Pontia protodice	Checkered white

Riodinidae	Metalmarks
Apodemia mormo virgulti	Behr's metalmark
Hesperiidae	Skippers
Erynnis funeralis	Funereal duskywing
Pyrgus communis albescens	Small checkered skipper

APPENDIX B: SPECIAL STATUS SPECIES POTENTIALS FOR OCCURRENCE

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Plants				
Abronia villosa var. aurita Chaparral sand-verbena	Annual herb. Sandy soils in chaparral, coastal scrub, desert dunes at 75-1600m elevation. Riverside, San Bernardino, Imperial, San Diego, Orange Cos. (presumed extirpated in Orange Co.), Arizona, Baja.	(Jan)Mar-Sep	Fed: None Calif: S2 CRPR: 1B.1	Low; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Allium marvinii Yucaipa onion	Perennial bulbiferous herb. Clay soils in openings in chaparral at 760-1065m. Riverside, San Bernardino, Orange, San Diego Cos.	Apr-May	Fed: None Calif: S1 CRPR: 1B.2 MSHCP: AC b USFS: S	Not expected; potentially suitable habitat, below elevation range, no documented occurrences within 5 mi., not observed during surveys.
Allium munzii Munz's onion	Perennial bulbiferous herb. Mesic, clay soils in chaparral, cismontane woodland, coastal scrub, pinyon juniper woodland, valley and foothill grassland at 297-1070m elevation. Western Riverside Co.	Mar-May	Fed: END Calif: THR, S1 CRPR: 1B.1 MSHCP: AC b	Low; no or marginal habitat, three documented occurrences within 5 mi. (from 1897, Menifee area – exact location unknown, mapped 4.5 mi. NE of site; 1962, exact location unknown, mapped 2.7 mi. NW; from 2015, 2.5 mi. SE), not observed during surveys.
Almutaster pauciflorus Alkali marsh aster	Perennial herb. Alkaline soils in meadows and seeps at 240 to 800m elevation. Inyo, Kern, Riverside, and San Bernardino Cos., SW and North-Central US, and Mexico.	Jun-Oct	Fed: None Calif: S1S2 CRPR: 2B.2	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Ambrosia pumila San Diego ambrosia	Perennial rhizomatous herb. Sandy or clay soils, often in disturbed areas, sometimes alkaline. Chaparral, coastal scrub, valley and foothill grassland, and vernal pools at 20-415m elevation. Riverside, San Diego Co., Baja.	Apr-Oct	Fed: END Calif: S1 CRPR: 1B.1 MSHCP: AC b	Not expected; potentially suitable habitat, above elevation range, no documented occurrences within 5 mi., not observed during surveys.
Amsinckia douglasiana Douglas' fiddleneck	Annual herb. Monterey shale, dry soils in cismontane woodland, valley and foothill grassland at sea level to 1950m elevation. Central coast of CA, few observations in southern CA. Not tracked in the CNDDB.	Mar-May	Fed: None Calif: S4 CRPR: 4.2	Not expected; no or marginal habitat, no mapped CCH records within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Arctostaphylos rainbowensis Rainbow manzanita	Perennial evergreen shrub. Chaparral at 205-670m elevation. Riverside and San Diego Cos.	Dec-Mar	Fed: None Calif: S2 CRPR: 1B.1 MSHCP: AC BLM: S USFS: S	Absent; potentially suitable habitat, no documented occurrences within 5 mi., conspicuous plant not observed during surveys.
Astragalus pachypus var. jaegeri Jaeger's milk-vetch	Perennial shrub. Sandy or rocky soils in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland at 365-975m elevation. Riverside and San Diego Cos.	Dec-Jun	Fed: None Calif: S1 CRPR: 1B.1 MSHCP: AC USFS: S BLM: S	Low; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Atriplex coronata var. notatior San Jacinto Valley crownscale	Annual herb. Alkaline soils in playas, mesic areas of valley and foothill grassland, vernal pools at 139-500m elevation. Western Riverside Co.	Apr-Aug	Fed: END Calif: S1 CRPR: 1B.1 MSHCP: AC d	Not expected; no suitable habitat, no documented occurrences within 5 mi. not observed during surveys.
Atriplex parishii Parish's brittlescale	Annual herb. Alkaline soils in chenopod scrub, playas, vernal pools at 25-1900m elevation; Riverside, San Bernardino, LA, Orange, and San Diego Cos. and Baja. Presumed extirpated in LA, Orange, and San Bernardino Cos.	Jun - Oct	Fed: None Calif: S1 CRPR: 1B.1 MSHCP: AC d USFS: S	Not expected; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Atriplex serenana var. davidsonii Davidson's saltscale	Annual herb. Alkaline soils in coastal bluff scrub, coastal scrub at 10-200m elevation; Channel Islands, LA, Orange, Riverside, San Luis Obispo, Santa Barbara, and Ventura Cos. Presumed extirpated in Santa Barbara Co., possibly extirpated in LA Co.	Apr - Oct	Fed: None Calif: S1 CRPR: 1B.2 MSHCP: AC d	Not expected; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Ayenia compacta California ayenia	Perennial herb. Rocky soils in Mojavean and Sonoran desert scrub at 150-1095m elevation. Riverside, San Bernardino, San Diego Cos., Arizona, Sonora and Baja Mexico.	Mar-Apr	Fed: None Calif: S3 CRPR: 2B.3	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Brodiaea filifolia Thread-leaved brodiaea	Perennial bulbiferous herb. Often on clay soils in chaparral openings, cismontane woodland, coastal scrub, playas, valley and foothill grassland, and vernal pools at 25-1120m elevation. LA, Orange, Riverside, San Bernardino, and San Diego Cos.; scattered in Southern CA foothills & valleys.	Mar-Jun	Fed: THR Calif: END, S2 CRPR: 1B.1 MSHCP: AC d	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Brodiaea santarosae Santa Rosa Basalt brodiaea	Perennial bulbiferous herb. Basalt in valley and foothill grassland. Santa Rosa Plateau, Riverside and San Diego Cos.	May-Jun	Fed: None Calif: S1 CRPR: 1B.2 USFS: S	Absent; no suitable habitat, outside geographic range, no documented occurrences within 5 mi., not observed during surveys.
Calochortus catalinae Catalina mariposa-lily	Perennial bulbiferous herb. Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland at 15-700m elevation. LA, Orange, Riverside, San Bernardino, Santa Barbara, Ventura Co, some Channel Islands. Not tracked in CNDDB.	(Feb)Mar-Jun	Fed: None Calif: S3S4 CRPR: 4.2	Low; potentially suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.
Calochortus plummerae Plummer's mariposa lily	Perennial bulbiferous herb. Granitic rocky soils in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grassland at 100-1700m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Ventura Cos.	May-Jul	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Low; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Calochortus weedii var. intermedius Intermediate mariposa lily	Perennial bulbiferous herb. Rocky, calcareous soils in chaparral, coastal scrub, valley and foothill grassland at 105-855m elevation. LA, Orange, San Bernardino, and western Riverside Co.	May-Jul	Fed: None Calif: S3 CRPR: 1B.2 USFS: S MSHCP: AC	Low; potentially suitable habitat, two documented occurrences within 5 mi. (2003, 3.5 mi. S; 2015, 4.2 mi. SE), not observed during surveys.
Carex buxbaumii Buxbaum's sedge	Perennial rhizomatous herb. Bogs and fens, mesic meadows and seeps, marshes and swamps at 3-3300m elevation. Most of US, northern CA, one occurrence reported near Lake Elsinore in Riverside Co. Not tracked in CNDDB.	Mar-Aug	Fed: None Calif: S3 CRPR: 4.2	Absent; no suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Caulanthus simulans Payson's jewelflower	Annual herb. Chaparral, coastal scrub at 90-2200m elevation. North-facing slopes and ridgelines on sandy-granitic soils, frequently on steep rocky slopes, in burned areas, or disturbed sites such as streambeds. Orange, western Riverside, San Diego Cos.	(Feb)Mar-May(Jun)	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Centromadia pungens ssp. *laevis* Smooth tarplant	Annual herb. Alkaline soils in chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland at 0-640m elevation. Also fallow fields, drainage ditches; mainly in SW Riverside Co., a few sites in interior valleys of LA, San Bernardino, San Diego Cos.	Apr-Sep	Fed: None Calif: S2 CRPR: 1B.1 MSHCP: AC d	Moderate; potentially suitable habitat, 11 documented occurrences within 5 mi. (1999 thru 2021, closest is 0.7 mi. NNW), not observed during surveys.
Chorizanthe leptotheca Peninsular spineflower	Annual herb. Granitic soils and alluvial fans in chaparral, coastal scrub, lower montane coniferous forest at 300-1900m elevation. Riverside, San Bernardino, LA, San Diego, Kern, San Luis Obispo Cos., Baja. Not tracked in the CNDDB.	May-Aug	Fed: None Calif: S3 CRPR: 4.2 MSHCP: AC	Not expected; no or marginal habitat, one mapped CCH record within 5 mi. (1893, mapped 2.1 mi. NE), not observed during surveys.
Chorizanthe parryi var. *parryi* Parry's spineflower	Annual herb. Sandy or rocky soils and openings in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland at 275-1220m elev. LA, Riverside, San Bernardino Cos.	Apr-Jun	Fed: None Calif: S2 CRPR: 1B.1 USFS: S BLM: S MSHCP: AC	Moderate; potentially suitable habitat, 18 documented occurrences within 5 mi. (1998 thru 2017, closest is 0.9 mi. SW), not observed during surveys.
Chorizanthe polygonoides var. longispina Long-spined spineflower	Annual herb. Often on clay soils in chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools at 30-1530m elevation. Orange, Riverside, San Diego Cos., Baja.	Apr-Jul	Fed: None Calif: S3 CRPR: 1B.2 MSHCP: AC	Occurs; observed on site during surveys in 2017.
Clinopodium chandleri San Miguel savory	Perennial shrub. Rocky, gabbroic, or metavolcanic soils in chaparral, cismontane woodlands, coastal scrub, riparian woodland, valley and foothill grassland at 120-1075m elevation. Orange, Riverside, San Diego Co., Baja.	Mar-Jul	Fed: None Calif: S2 CRPR: 1B.2 MSHCP: AC b BLM: S USFS: S	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Convolvulus simulans Small-flowered morning-glory	Annual herb. Clay soils, serpentinite seeps, chaparral openings, coastal scrub, valley and foothill grassland at 30-740m elevation. LA, Orange, Riverside, San Bernardino, San Diego Cos. and Central CA, Baja. Not tracked in CNDDB.	Mar-Jul	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Low to moderate; potentially suitable habitat, nine mapped CCH records within 5 mi. (1991-2018, all about 2.5 mi. SE), not observed during surveys.
Cryptantha wigginsii Wiggins' cryptantha	Annual herb. Coastal scrub at 20-275m elevation, often on clay soils. LA, Riverside, San Diego Cos., Catalina Island, and Baja.	Feb-Jun	Fed: None Calif: S1 CRPR: 1B.2	Not expected; potentially suitable habitat, above elevation range, no documented occurrences within 5 mi., not observed during surveys.
Deinandra (Hemizonia) paniculata Paniculate tarplant	Annual herb. Usually vernally mesic areas, sometimes sandy. Coastal scrub, valley and foothill grassland, vernal pools at 25-940m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Ventura, Kern, Santa Barbara, San Luis Obispo Cos., Baja. Not tracked in the CNDDB.	(Mar) Apr-Nov	Fed: None Calif: S4 CRPR: 4.2	Low; potentially suitable or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Dodecahema leptoceras Slender-horned spineflower	Annual herb. Open, sandy alluvial benches in valleys & canyons. Chaparral, coastal scrub (alluvial fans), cismontane woodland at 200-760m elevation. LA, Riverside, San Bernardino Cos.	Apr-Jun	Fed: END Calif: END, S1 CRPR: 1B.1 MSHCP: AC b	Not expected; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Dudleya multicaulis Many-stemmed dudleya	Perennial herb. Often on clay soils in chaparral, coastal scrub, valley and foothill grassland at 15-790m elevation. LA, Orange, Riverside, San Bernardino, San Diego Cos.	Apr-Jul	Fed: None Calif: S2 CRPR: 1B.2 USFS: S MSHCP: AC b	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Eryngium aristulatum var. parishii San Diego button-celery	Annual/perennial herb. Mesic areas in coastal scrub, valley and foothill grassland, vernal pools at 20-620m elevation. Riverside, LA, Orange, San Diego Cos. and Baja.	Apr-Jun	Fed: END Calif: END, S1 CRPR: 1B.1 MSHCP: AC	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Erythranthe diffusa Palomar monkeyflower	Annual herb. Sandy or gravelly soils in chaparral, lower montane coniferous forest at 1220-1830m elevation. Orange, Riverside, San Diego Co., Baja. Not tracked in the CNDDB.	Apr-Jun	Fed: None Calif: S3 CRPR: 4.3	Absent; no or marginal habitat, well below elevation range, no mapped CCH records within 5 mi., not observed during surveys.
Geothallus tuberosus Campbell's liverwort	Ephemeral liverwort. Grows on soil in mesic coastal scrub, vernal pools at 10-600m elevation. Riverside and San Diego Cos.	Not applicable	Fed: None Calif: S2 CRPR: 1B.1	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Harpagonella palmeri Palmer's grapplinghook	Annual herb. Clay soils and open grassy areas within shrubland in chaparral, coastal scrub, valley and foothill grassland at 20-955m elevation. LA, Orange, Riverside, San Diego Co., Catalina Island, AZ, Baja and Sonora, Mexico.	Mar-May	Fed: None Calif: S3 CRPR: 4.2 MSHCP: AC	Not expected; no or marginal habitat, one documented occurrence within 5 mi. (1981, 2.4 mi. SE), not observed during surveys.
Hesperocyparis forbesii Tecate cypress	Perennial evergreen tree. Clay, gabbroic, or metavolcanic soils in closed-cone coniferous forest, chaparral at 80-1500m elevation. Orange, Riverside, San Diego Co., Baja.	Not applicable	Fed: None Calif: S2 CRPR: 1B.1	Absent; no or marginal habitat, no documented occurrences within 5 mi., conspicuous plant not observed during surveys.
Holocarpha virgata ssp. elongata Graceful (curving) tarplant	Annual herb. Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland at 60-1100m elevation. Orange, Riverside, San Diego Cos. Known in Riverside County only from the Santa Rosa Plateau. Not tracked in CNDDB.	May-Nov	Fed: None Calif: S3 CRPR: 4.2 MSHCP: AC	Not expected; potentially suitable habitat, outside geographic range, no mapped CCH records within 5 mi., not observed during surveys.
Hordeum intercedens Vernal barley	Annual grass. Saline flats and depressions in valley and foothill grassland, vernal pools, coastal dunes, coastal scrub at 5-1000m elevation. LA, Orange, Riverside, San Diego Cos., Central CA, Channel Islands. Not tracked in the CNDDB.	Mar-Jun	Fed: None Calif: S3S4 CRPR: 3.2 MSHCP: AC	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Juglans californica Southern California black walnut	Perennial deciduous tree. Alluvial soils in chaparral, cismontane woodland, coastal scrub, riparian woodland at 50-900m elevation. LA, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, Ventura Cos., Central and Northern CA. Not tracked in CNDDB.	Mar-Aug	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Occurs; observed onsite during surveys.
Juncus acutus ssp. leopoldii Southwestern spiny rush	Perennial rhizomatous herb. Mesic coastal dunes, alkaline seeps, coastal salt marshes at 3-900m elevation. S CA, central coast, AZ, NV, other areas. Not tracked in CNDDB.	(Mar)May-Jun	Fed: None Calif: S4 CRPR: 4.2	Absent; no suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.
Juncus luciensis Santa Lucia dwarf rush	Annual herb. Chaparral, Great Basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools at 300-2040m elevation. Riverside and San Diego Cos., central and northern CA.	Apr-Jul	Fed: None Calif: S3 CRPR: 1B.2 USFS: S	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Lasthenia glabrata spp. coulteri Coulter's goldfields	Annual herb. Coastal salt marshes and swamps, playas, vernal pools at 1-1220m elevation. Riverside, San Bernardino, LA, Orange, Ventura Cos., Central and Northern CA, Baja. Presumed extirpated in LA, San Bernardino Cos.	Feb-Jun	Fed: None Calif: S2 CRPR: 1B.1 BLM: S MSHCP: AC d	Absent; no suitable habitat, three documented occurrences within 5 mi. (2003, 1.7 mi. N, appears to be developed; 2011, 3.3 mi. SE; 2015, 2.7 mi. NW), not observed during surveys.
Lathyrus splendens Pride-of-California	Perennial herb. Chaparral at 200-1525m elevation. LA, Riverside, San Bernardino Cos., Baja. Not tracked in CNDDB.	Mar-Jun	Fed: None Calif: S4 CRPR: 4.3	Not expected; potentially marginal habitat, no mapped CCH records within 5 mi., not observed during surveys.
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	Annual herb. Chaparral, coastal scrub at 1-885m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Ventura, Santa Barbara, Mono Cos., Channel Islands, Baja.	Jan-Jul	Fed: None Calif: S3 CRPR: 4.3	Low; potentially suitable habitat, two documented occurrences within 5 mi. (2006, 2.0 mil SSW; 2008, 3.3 mi. N), not observed during surveys.
Lilium humboldtii ssp. ocellatum Ocellated Humboldt lily	Perennial bulbiferous herb. Openings in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, riparian woodland at 30-1800m elevation. LA, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, Ventura Co, some Channel Islands. Lower stream benches in riparian corridors in lower montane coniferous forest and coastal chaparral or shaded, dry slopes beneath a dense oak or conifer canopy.	Mar-Jul(Aug)	Fed: None Calif: S4? CRPR: 4.2 MSHCP: NAC f	Absent; no suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.
Lilium parryi Lemon lily	Perennial bulbiferous herb. Mesic soils in upper and lower montane coniferous forest, riparian forest, meadows and seeps at 1220-2745m elevation. LA, Riverside, San Bernardino, San Diego Co, Arizona, Sonora Mex.	Jul-Aug	Fed: None Calif: S3 CRPR: 1B.2 USFS: S MSHCP: NAC f	Absent; no suitable habitat, well below elevation range, no documented occurrences within 5 mi., not observed during surveys.
Limnanthes alba ssp. parishii Parish's meadowfoam	Annual herb. Vernally mesic areas in lower montane coniferous forest, meadows and seeps, vernal pools at 600-2000m elevation. Riverside and San Diego Cos.	Apr-Jun	Fed: None Calif: END, S2 CRPR: 1B.2 USFS: S BLM: S MSHCP: AC	Absent; no suitable habitat, below elevation range, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Microseris douglasii ssp. platycarpha Small-flowered microseris	Annual herb. Clay soils in cismontane woodland, coastal scrub, valley and foothill grassland, vernal pools at 15-1070m elevation. LA, Orange, Riverside, San Diego Cos., Channel Islands, Baja. Not tracked in CNDDB.	Mar-May	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Low; potentially suitable habitat, eight mapped CCH records within 5 mi. (2000, 1.5 mi. N, 1996, 2.7 mi. WSW; 1992-2015, all about 2.5 mi. SE), not observed during surveys.
Monardella hypoleuca ssp. intermedia Intermediate monardella	Perennial rhizomatous herb. Chaparral, cismontane woodlands, sometimes lower montane coniferous forest at 400-1250m elevation. Orange, Riverside, San Diego Co.	Apr-Sep	Fed: None Calif: S2? CRPR: 1B.3	Not expected; potentially marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Myosurus minimus ssp. apus Little mousetail	Annual herb. Valley and foothill grasslands, alkaline vernal pools at 20-640m elevation. Riverside, San Bernardino, San Diego Cos., Central and Northern CA, Oregon, Baja.	Mar-Jun	Fed: None Calif: S2 CRPR: 3.1 MSHCP: AC d	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Nama stenocarpa Mud nama	Annual/perennial herb. Found in marshy habitat on lake margins and riverbanks at 5-500m elevation. S CA, San Clemente Island, central CA, AZ, TX, Baja, Sonora.	Mar-Oct	Fed: None Calif: S1S2 CRPR: 2B.2 MSHCP: AC d	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Navarretia fossalis Spreading navarretia	Annual herb. Chenopod scrub, shallow freshwater marshes and swamps, playas, vernal pools at 30-655m elevation. LA, Riverside, San Diego, San Luis Obispo Cos., Baja.	Apr-Jun	Fed: THR Calif: S2 CRPR: 1B.1 MSHCP: AC b	Absent; no suitable habitat six documented occurrences within 5 mi. (1922, exact location unknown, mapped 1.0 mi. SE; 2001-2017, closest is 1.6 mi. N, appears to have been developed), not observed during surveys.
Navarretia prostrata Prostrate vernal pool navarretia	Annual herb. Mesic areas in coastal scrub, valley and foothill grassland (alkaline), meadows and seeps, vernal pools at 3-1210m elevation. Locations in northern, central, and southern CA.	Apr-Jun	Fed: None Calif: S2 CRPR: 1B.2 MSHCP: AC d	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Orcuttia californica California Orcutt grass	Annual grass. Vernal pools at 15-660m elevation. LA, Orange, Riverside, San Diego, Ventura Co., Baja.	Apr-Aug	Fed: END Calif: END, S1 CRPR: 1B.1 MSHCP: AC b	Absent; no suitable habitat, three documented occurrences within 5 mi. (1941, exact location unknown, mapped 1.2 mi. NNE, possibly extirpated; 2001, 1.8 mi. ESE; 2015, 1.8 mi. E), not observed during surveys.
Polygala cornuta var. fishiae Fish's milkwort	Perennial deciduous shrub. Chaparral, cismontane woodland, riparian woodlands at 100-1000m elevation. LA, Orange, Riverside, Santa Barbara, San Diego, and Ventura Co., Baja. Not tracked in CNDDB.	May-Aug	Fed: None Calif: S4 CRPR: 4.3 MSHCP: AC	Absent; potentially marginal habitat, no mapped CCH records within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Pseudognaphalium leucocephalum White rabbit-tobacco	Perennial herb. Sandy or gravelly soils in chaparral, cismontane woodland, coastal scrub, riparian woodland at 0-2100m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Ventura Cos., AZ, NM, TX, Baja and Sonora Mex.	(Jul)Aug-Nov(Dec)	Fed: None Calif: S2 CRPR: 2B.2	Low; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Quercus engelmannii Engelmann oak	Perennial deciduous tree. Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland at 50-1300m elevation. Mostly in foothills of Orange, west Riverside, San Bernardino, and San Diego Counties, also southeast San Gabriel Mountain foothills (LA County). Not tracked in the CNDDB.	Mar-Jun	Fed: None Calif: S3 CRPR: 4.2	Absent; potentially suitable habitat, conspicuous plant not observed during surveys.
Romneya coulteri Coulter's matilija poppy	Large perennial rhizomatous herb. Often in burn areas in chaparral, coastal scrub at 20-1200m elevation. LA, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo Cos. Not tracked in CNDDB.	Mar-Jul(Aug)	Fed: None Calif: S4 CRPR: 4.2 MSHCP: AC	Absent; no or marginal habitat, conspicuous plant not observed during surveys.
Scutellaria bolanderi ssp. austromontana Southern mountains skullcap	Perennial rhizomatous herb. Mesic areas in chaparral, cismontane woodland, lower montane coniferous forest at 425-2000m elevation. Often in meadows and along streams. LA, Riverside, San Bernardino, San Diego Cos. Presumed extirpated in LA and San Bernardino Cos.	Jun-Aug	Fed: None Calif: S3 CRPR: 1B.2 USFS: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Sibaropsis hammittii Hammitt's clay-cress	Annual herb. Clay soils in chaparral openings, valley and foothill grassland at 720-1065m elevation. Riverside and San Diego Co.	Mar-Apr	Fed: None Calif: S2 CRPR: 1B.2 USFS: S MSHCP: AC b	Absent; no or marginal habitat, no documented occurrences within 5 mi., below elevation range, not observed during surveys.
Sidalcea neomexicana Salt spring checkerbloom	Perennial herb. Alkaline, mesic soils in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, playas at 15-1530m elevation. Kern, LA, Orange, Riverside, San Bernardino, San Diego, Ventura Cos., western US, Sonora Mex. Presumed extirpated in LA Co.	Mar-Jun	Fed: None Calif: S2 CRPR: 2B.2 USFS: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Sphaerocarpos drewiae Bottle liverwort	Ephemeral liverwort. Grows on soil in openings in chaparral and coastal scrub at 90-600m elevation. Riverside and San Diego Cos.	Not applicable	Fed: None Calif: S1 CRPR: 1B.1	Not expected; potentially suitable habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Growth Form, Habitat and Distribution	Flowering Season	Conservation Status	Potential for Occurrence
Symphyotrichum defoliatum San Bernardino aster	Perennial rhizomatous herb. Near ditches, streams, springs in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, valley and foothill grasslands (vernally mesic) at 2-2040m elevation. LA, Orange, Riverside, San Bernardino, San Diego, Imperial, Kern, Santa Barbara, San Luis Obispo Cos.	Jul-Nov	Fed: None Calif: S2 CRPR: 1B.2 USFS: S BLM: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Texosporium sancti-jacobi Woven-spored lichen	Crustose lichen. Grows on soil, small mammal pellets, dead twigs, and *Selaginella* species, in chaparral openings at 60-660m elevation. LA, Riverside, San Diego, Ventura, Santa Barbara, San Benito Cos., San Clemente Island, ID, OR, WA.	Not applicable	Fed: None Calif: S2 CRPR: 3	Not expected; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Tortula californica California screw-moss	Moss. Sandy soil in chenopod scrub, valley and foothill grassland at 10-1460m elevation. LA, Riverside, San Diego, Ventura Cos., Central and Northern CA, Channel Islands.	Not applicable	Fed: None Calif: S2? CRPR: 1B.2 BLM: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Trichocoronis wrightii var wrightii Wright's trichocoronis	Annual herb. Alkaline soils in meadows and seeps, marshes and swamps, riparian forest, vernal pools at 5-435m elevation. Riverside Co., Central Valley, TX, Baja.	May-Sep	Fed: None Calif: S1 CRPR: 2B.1 MSHCP: AC b	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Viguiera laciniata San Diego County viguiera	Perennial shrub. Chaparral, coastal scrub at 60-750m elevation. Riverside, Orange, San Diego Cos (occurrences outside of San Diego Co are introduced), Baja and Sonora, Mexico. Not tracked in CNDDB.	Feb-Jun(Aug)	Fed: None Calif: S4 CRPR: 4.3	Absent; potentially suitable habitat, no mapped CCH records within 5 mi., not observed during surveys.
References: CDFW (2021a, 2021c), USFWS (2021), CNPS (2021), Dudek (2003), RCA (2020)				

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Invertebrates			
Bombus crotchii Crotch bumble bee	Coastal CA E to Sierra-Cascade crest & S into Mexico. Open grassland and scrub habitats. Food plant genera include *Antirrhinum, Asclepias, Chaenactis, Lupinus, Medicago, Salvia, Phacelia, Clarkia, Dendromecon, Eschscholzia,* and *Eriogonum*. Lives in colonies that may be underground in rodent holes or above ground in rock piles, tree cavities, etc.	Fed: None Calif: SA[3], S1S2	Low to moderate; potentially suitable habitat, food plants present, two documented occurrences within 5 mi. (2001, 1.5 mi. WNW; 1975, exact location unknown, mapped 3.5 mi. NW), no bee colonies incidentally observed during surveys.
Branchinecta lynchi Vernal pool fairy shrimp	Vernal pools or similar vernal habitats, requires cool water pools (≤50ºF to hatch, ≤75ºF to survive); disjunct locations in Riverside Co. and the Coast Ranges thru Central Valley to Tehama Co., southern Oregon, up to elevation of 1159m.	Fed: THR Calif: SA, S3 MSHCP: AC a	Absent; no suitable habitat, no documented occurrences within 5 mi.
Branchinecta sandiegonensis San Diego fairy shrimp	Vernal pool complexes; endemic to San Diego and Orange County mesas. One occurrence in Murrieta is a transplant to a mitigation pool outside of native range.	Fed: END Calif: SA, S2	Absent; no suitable habitat, one documented occurrence within 5 mi. (2017, Clayton Ranch Mitigation Site; transplant outside of native range).
Cincindela senilis frosti Senile tiger beetle	Coastal salt marshes, tidal mud flats, interior alkali mud flats. CA and northern Mexico, San Diego Co. to Sonoma and Lake Co.	Fed: None Calif: SA, S1	Absent; no suitable habitat, no documented occurrences within 5 mi.
Danaus plexippus pop. 1 Monarch butterfly	California overwintering population.	Fed: CAN State: SA, S2S3 USFS: S (Los Padres NF)	Absent; individual butterflies may be present, but too far inland for overwintering.

[3] Crotch bumble bee was previously a candidate for state listing, but the Sacramento Superior Court ruled that insects are not eligible for listing under the California Endangered Species Act: *Almond Alliance of California v. California Department of Fish and Wildlife*, Sacramento Superior Court No. 34-2019-80003216 (Nov. 13, 2020). The California Fish and Game Commission filed an intent to appeal this decision in February 2021. The status of this species may be affected by subsequent litigation or changes to regulations.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Euphydryas editha quino Quino checkerspot butterfly	Coastal scrub, open chaparral, juniper woodland, native grassland. Western Riverside Co., southern San Diego Co., Baja. Flight season from mid-Jan to late May. Host plants are dwarf plantain (*Plantago erecta*), purple owl's clover (*Castilleja exserta*), white snapdragon (*Antirrhinum coulterianum*), wooly plantain (*Plantago patagonica*), thread-leaved bird's beak (*Cordylanthus rigidus*). USFWS considers species extirpated in San Bernardino Co.	Fed: END Calif: SA, S1S2 MSHCP: AC	Low; potentially marginal habitat, one host plant species present (*Plantago erecta*), 11 documented occurrences within 5 mi. (1997-2003, closest is 2.6 mi. SE), not observed during focused surveys in 2004 and not incidentally observed during later surveys.
Linderiella occidentalis California linderiella	Vernal pools, seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and total dissolved solids. N and Central CA, Riverside (Santa Rosa Plateau) and Ventura Cos.	Fed: None Calif: SA, S2S3	Absent; no suitable habitat, outside known geographic range.
Linderiella santarosae Santa Rosa Plateau fairy shrimp	Found only in the basalt vernal pools on Santa Rosa Plateau in Riverside County.	Fed: None Calif: SA, S1 MSHCP: AC a	Absent; no suitable habitat, outside known geographic range.
Neolarra alba White cuckoo bee	Cleptoparasitic in the nests of perdita bees. Known only from localities in Southern California. All occurrences are historical.	Fed: None Calif: SA, SH	Not expected; no documented occurrences within 5 mi., all occurrences are historical.
Socalchemmis icenoglei Icenogle's socalchemmis spider	Coastal scrub; known only from the type locality in the vicinity of Winchester, Riverside Co.	Fed: None Calif: SA, S1	Not expected; no documented occurrences within 5 mi.
Streptocephalus woottoni Riverside fairy shrimp	Endemic to Western Riverside, Orange, and San Diego counties in areas of tectonic swales/earth slump basins in grassland and coastal sage scrub. Coastal scrub, valley & foothill grassland, vernal pool, wetland. Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season. Generally restricted to pools greater than 12 inches deep. All known populations lie between 30 and 415 meters elevation.	Fed: END Calif: SA, S1S2 MSHCP: AC a	Absent; no suitable habitat, 8 documented occurrences within 5 mi. (2002-2017, closest extant is 1.8 mi. ESE).
Fish			
Gila orcuttii Arroyo chub	Slow-moving or backwater sections of warm/ cool streams with mud or sand substrates. LA, San Gabriel, San Luis Rey, Santa Ana & Santa Margarita Riv & Malibu & San Juan creeks.	Fed: None Calif: SSC, S2 MSHCP: AC USFS: S	Absent; no perennial aquatic habitat.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Amphibians			
Anaxyrus californicus Arroyo toad	Washes & intermittent streams of semi-arid regions, sandy-banked rivers, riparian woodlands, & loose gravel. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range, below 4600 ft. Southern California to tip of Baja California. Desert pop. along Mojave River.	Fed: END Calif: SSC, S2S3 MSHCP: AC c	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Rana draytonii California red-legged frog	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	Fed: THR Calif: SSC, S2S3 MSHCP: AC c	Absent; no perennial aquatic habitat.
Spea hammondii Western spadefoot toad	Cismontane woodland, coastal scrub, valley & foothill grassland, vernal pool. Breeds in quiet streams & vernal pools, burrows beneath sand during dry season. W CA, Central Valley to Baja California. From near sea level up to 4,500 ft elev.	Fed: None Calif: SSC, S3 BLM: S MSHCP: AC	Absent; no suitable habitat, 17 documented occurrences within 5 mi. (1998-2019, closest is 1.1 mi. NE), not observed during surveys.
Taricha torosa Coast Range newt	Valley-foothill hardwood and hardwood-conifer, coastal scrub, chaparral, grassland, mixed conifer. Coast Ranges from N San Diego Co. to central Mendocino Co., southern Sierra Nevada foothills S of Kaweah River. Spends most of the year in subterranean refuges, migrates to aquatic breeding areas in the fall and returns in the spring.	Fed: None Calif: SSC, S4 MSHCP: AC	Absent; no suitable aquatic breeding habitat on or adjacent to the site, no documented occurrences within 5 mi., not observed during surveys but is secretive.
Reptiles			
Anniella stebbinsi (Anniella pulchra pulchra) Southern California legless lizard	Various habitats, mainly shrublands, <6500 ft. elev. Coast Ranges from Bay area to N Baja CA, SW Sierra Nevada, parts of the Central Valley, Transverse & Peninsular Ranges.	Fed: None Calif: SSC, S3 USFS: S	Low to moderate; potentially suitable habitat, one documented occurrence within 5 mi. (2011, 3.9 mi. SW), not observed during surveys but is secretive.
Arizona elegans occidentalis California glossy snake	Arid scrub, rocky washes, grasslands, chaparral, often with loose or sandy soils. Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular Ranges, south to Baja California. Sea level to 7200' elev. Nocturnal.	Fed: None Calif: SSC, S2	Low; potentially marginal habitat, three documented occurrences within 5 mi. (1977, exact location unknown, mapped 3.4 mi. NW; 1946, exact location unknown, mapped 4.7 mi. SW; 1946, exact location unknown, mapped 4.2 mi. W), not observed during surveys but is nocturnal.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Aspidoscelis hyperythra Orange-throated whiptail	Low-elevation coastal scrub, chaparral, valley-foothill hardwood, sea level to 1040m. Sandy areas, patches of rock. S CA, west of desert to tip of Baja CA.	Fed: None Calif: WL, S2S3 USFS: S MSHCP: AC	Occurs; observed on the site during surveys.
Aspidoscelis tigris stejnegeri Coastal whiptail	Primarily hot, dry open areas with sparse foliage, chaparral, woodland, riparian; coastal So CA, mostly west of Peninsular Ranges and south of Transverse Ranges, north into Ventura County, below ±7000' elev. and into Baja.	Fed: None Calif: SSC, S3 MSHCP: AC	Occurs; observed on the site during surveys.
Coleonyx variegatus abbotti San Diego banded gecko	Rock outcrops in shrublands, to 5000' elevation; southwest Calif. through much of n. Baja Calif.	Fed: None Calif: SSC, S1S2 MSHCP: AC	Low; potentially marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Crotalus ruber Red-diamond rattlesnake	Desert scrub, thorn scrub, chaparral below 4,000ft. San Bernardino County S through most of Baja California, Mexico.	Fed: None Calif: SSC, S3 USFS: S MSHCP: AC	Low; no or marginal habitat, two documented occurrences within 5 mi. (2001, 2.5 mi. WSW; 2001, 1.5 mi. NW), not observed during surveys.
Diadophis punctatus modestus San Bernardino ringneck snake	Open relatively rocky areas within valley-foothill locales, mixed chaparral/annual grasslands. Prefers moist habitats. W San Diego & Riv. Cos., SW San Bern., Vent. & LA Cos., NW Baja CA.	Fed: None Calif: SA, S2? USFS: S	Low; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.
Emys marmorata Western pond turtle	Perennial ponds, streams, marshes, irrigation ditches. Coastal S & cent. CA, NW Baja CA, below about 4800 ft. elev. (few higher elev. pops.)	Fed: None Calif: SSC, S3 BLM: S USFS: S MSHCP: AC	Absent; no perennial aquatic habitat.
Phrynosoma blainvillii Coast horned lizard	Coastal sage scrub, low elevation chaparral, annual grassland, riparian scrub and woodlands, desert wash, pinyon and juniper woodland, valley and foothill grassland, 0-2438m elevation. SW California to NW Baja California, Mexico.	Fed: None Calif: SSC, S3S4 BLM: S MSHCP: AC	Occurs; observed on the site during surveys.
Salvadora hexalepis virgultea Coast patch-nosed snake	Shrublands, washes, sandy flats, rocky areas; Santa Barbara County through southwest Calif., to northwest Baja Calif. Diurnal.	Fed: None Calif: SSC, S2S3	Low; no or marginal habitat, no documented occurrences within 5 mi., not observed during surveys.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Thamnophis hammondii Two-striped gartersnake	Usually in or near perennial fresh water & adjacent riparian habitat, pools in streams. SW CA & NW Baja California. Usually in or near perennial fresh water & adjacent riparian habitat, pools in streams. SW CA & NW Baja California. Primarily aquatic. Diurnal. Also active at night and at dusk during hot weather in some areas. Can be active most of the year depending on weather conditions. Has been found from January to November.	Fed: None Calif: SSC, S3S4 BLM: S USFS: S	Absent; no suitable habitat, no documented occurrences within 5 mi., not observed during surveys.
Birds			
Accipiter cooperii Cooper's hawk	Cismontane woodland, riparian forest, riparian woodland, upper montane coniferous forest. Forages in open areas over scrublands; California, Mexico, Central America. Nests in trees, often in dense woods. Year-round resident in most of southern California range. CNDDB only tracks nesting.	Fed: None Calif: WL, S4 MSHCP: AC	Occurs (foraging), low (nesting); observed on the site during surveys, no or marginal nesting habitat, no documented occurrences (nesting) within 5 mi.
Aechmophorus clarkii Clark's grebe	Requires large, open waters for courtship, feeding, and flocking, and extensive beds of tall, emergent vegetation such as tules or cattails for nesting; generally nests in colonies. Not tracked in CNDDB.	Fed: BCC Calif: None	Absent (foraging and nesting); no suitable habitat, may be seen in migration or moving between large lakes in the region, not observed during surveys.
Agelaius tricolor Tricolored blackbird	Breeds colonially in freshwater marshes, nomadic among marshes and fields in winter; almost completely endemic to Calif. Year-round resident in southern California range. CNDDB only tracks nesting.	Fed: BCC Calif: THR, SSC, S1S2 BLM: S MSHCP: AC	Low to moderate (foraging), absent (nesting); potentially suitable wintering habitat, no suitable nesting habitat, one documented occurrence (nesting) within 5 mi. (2008, 4.9 mi. SE), several eBird records in vicinity, not observed during surveys.
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	Sparse, mixed chaparral, scrub, rocky, brushy slopes. Central California to Baja California. Year-round resident in southern California range.	Fed: None Calif: WL, S3 MSHCP: AC	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Aquila chrysaetos Golden eagle	Found in a variety of habitats from sea level to 11,500 feet, rugged open habitats preferred. Large platform nests constructed on secluded cliffs, large trees, and occasionally structures (i.e., electrical transmission towers). CNDDB tracks nesting and wintering.	Fed: BGEPA, BCC Calif: FP, WL, S3 BLM: S MSHCP: AC	Not expected (foraging), absent (nesting); potentially marginal foraging habitat, no suitable nesting habitat, one documented occurrence (nesting) within 5 mi. (1974, 2.5 mi. N), multiple eBird records in vicinity (may be seen soaring overhead), not observed during surveys.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Ardea alba Great egret	Brackish and freshwater marshes, estuary, riparian forest, wetland. Colonial nester in large trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes. CNDDB only tracks nesting colonies.	Fed: none Calif: SA, S4	Occurs (foraging or fly over), absent (nesting); observed onsite during surveys, no nesting habitat or nesting colonies present.
Ardea herodias Great blue heron	Brackish and freshwater marshes, estuary, riparian forest, wetland. Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows. CNDDB only tracks nesting colonies.	Fed: none Calif: SA, S4 MSHCP: AC	Occurs (fly over), not expected (foraging), absent (nesting); no or marginal foraging habitat, no suitable nesting habitat, no documented occurrences (nesting) within 5 mi., multiple eBird records in vicinity.
Artemisiospiza belli Bell's sage sparrow	Sage scrub and chaparral communities. Nests mainly in shrubs, also in grass, and occasionally on ground under shrub. Found in coastal sage scrub in south of range. Central Washington southward to Baja California, Mexico. Year-round resident in southern CA.	Fed: BCC Calif: WL, S3 MSHCP: AC	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Asio otus Long-eared owl	Conifer, oak, riparian, pinyon-juniper, and desert woodlands that are open or adjacent to grasslands, meadows, or shrublands. Most of CA *except* Central Valley, coastal LA and Orange Co., western Imperial Co., and central Riverside Co. Very limited breeding range in southern CA. CNDDB only tracks nesting.	Fed: None Calif: SSC, S3?	Not expected (foraging and nesting); no or marginal habitat, no documented occurrences (nesting) within 5 mi., no eBird records in vicinity, not observed during surveys.
Athene cunicularia Burrowing owl	Nests in rodent burrows, usually in grasslands. Forages in open habitat; increasingly uncomm. in S CA. Occurs through W US/Mex. Sparse in desert scrub but common around irrigated lands. CNDDB tracks burrow sites and some wintering sites.	Fed: BCC Calif: SSC, S3 BLM: S MSHCP: AC c	Occurs; observed on site during focused surveys in 2018. Not observed during focused surveys in 2019 and 2021.
Buteo regalis Ferruginous hawk	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Great Basin grassland and scrub, pinyon and juniper woodlands, valley and foothill grassland. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles. Does not breed in southern CA.	Fed: BCC Calif: WL, S3S4 MSHCP: AC	Low (foraging), absent (nesting); potentially suitable habitat foraging habitat (when fields are fallow), outside of breeding range, three documented occurrences within 5 mi. (2008, 4.1 mi. NE; 2007, 3.9 mi ENE; 2008, 2.4 mi. E), a few eBird records in vicinity, not observed during surveys.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Buteo swainsoni Swainson's hawk	Grassland/agricultural, large trees for nesting, desert scrub with Joshua tree & Fremont cottonwood overstory, near streams & open fields. Breeds overwhelmingly in Great Basin & Central Valley of California. Seen in migration in southern California. CNDDB only tracks nesting.	Fed: BCC Calif: THR, S3 BLM: S MSHCP: AC	Low (foraging), absent (nesting), may be seen in migration; potentially marginal foraging habitat, outside current breeding range, a few eBird records in vicinity, not observed during surveys.
Calypte costae Costa's hummingbird	Desert and coastal scrub and chaparral in desert, semi-desert and mountain foothills and seasonally in mountains, adjacent open meadows and gardens. Found in NV, UT, AZ, CA and Mexico. Year-round resident in southern CA. CNDDB only tracks nesting.	Fed: BCC Calif: SA, S4	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Campylorhynchus brunneicapillus sandiegensis Coastal cactus wren	Desert scrub and coastal sage scrub with cactus patches; Southern CA and northwestern Baja. Non-migratory. Pairs defend territories throughout the year. Limited to San Diego and Orange Cos.	Fed: BCC Calif: SSC, S3 USFS: S MSHCP: AC	Absent (foraging and nesting); no suitable habitat, outside current range, not observed during surveys.
Chamaea fasciata Wrentit	Chaparral, oak woodland, shrublands, western CA, northwestern Baja, western Oregon. Year-round resident in southern CA range. CNDDB does not track this species.	Fed: BCC Calif: None	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Charadrius nivosus Western snowy plover	Coastal beaches, sand spits, salt pans, river bars. Coastal areas from Washington State south to Baja. Federal listing applies only to the Pacific coastal population. CNDDB only tracks nesting. Year-round resident in southern CA range except for eastern deserts where it is seen in migration.	Fed: THR, BCC Calif: SSC, S2	Absent (foraging and nesting); no suitable habitat, no documented occurrences (nesting) within 5 mi., no eBird records in vicinity, not observed during surveys.
Circus hudsonius (C. cyaneus) Northern harrier	Open habitats with hunting perches, marshes, meadows, grasslands, pastures, croplands, lake and river edges. Nests on the ground. Breeds widely but locally in North America, various portions of CA including Central Valley, central and northern coast, northeastern CA, and southern coastal CA. Does not breed in most of southern CA range. CNDDB only tracks nesting.	Fed: None Calif: SSC, S3 MSHCP: AC	Occurs (foraging), low to moderate (nesting); observed on the site during surveys, potentially suitable nesting habitat, no documented occurrences (nesting) within 5 mi.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Dryobates (Picoides) nuttallii Nuttall's woodpecker	Found in low elevation riparian and oak woodlands, rarely in conifers. Central Valley, Transverse and Peninsular Ranges, Coast Ranges north to Sonoma Co., lower portions of the Cascade Range and Sierra Nevada. Year-round resident throughout coastal mountains of CA. Not tracked in CNDDB.	Fed: BCC Calif: None	Occurs (foraging), moderate (nesting); observed on the site during surveys, potentially marginal nesting habitat.
Elanus leucurus White-tailed kite	Breeds in woodlands and riparian forests, forages over open terrain; Pacific Coast (Calif, northern Baja, Oregon), other scattered localities. Year-round resident in southern CA range. CNDDB only tracks nesting.	Fed: None Calif: FP, S3S4 BLM: S MSHCP: AC	Occurs (foraging), low (nesting); observed on the site during surveys, no or marginal nesting habitat, no documented occurrences (nesting) within 5 mi., five nests within 10 mi. of the site (see Section 3.4.1).
Empidonax traillii extimus Southwestern willow flycatcher	Dense riparian forests, wet mountain meadow systems with standing water for at least part of the breeding season (May to July) & with ample numbers of willow & other associated trees & shrubs. Rare & local in S CA. SW US & N Baja California. CNDDB only tracks nesting.	Fed: END Calif: END, S1 MSHCP: AC a	Absent (foraging and nesting); no suitable habitat, no documented occurrences within 5 mi., not observed during surveys. Habitat assessment found no suitable habitat on the site.
Eremophila alpestris actia California horned lark	Variety of open habitats with low growing vegetation or bare ground, grasslands, rangelands, "bald" hills, mtn. meadows, open coastal plains, fallow fields, alkali flats. Within coastal Sonoma Co. to San Diego Co., San Joaquin Valley & E to foothills.	Fed: None Calif: WL, S4 MSHCP: AC	Occurs (foraging), high (nesting); observed on the site during surveys, potentially suitable nesting habitat.
Haliaeetus leucocephalus Bald eagle	Breed in large trees, usually near major rivers or lakes. Winters more widely. Wide but scattered distribution in N America, esp. coastal regions. CNDDB tracks nesting and wintering.	Fed: Delisted, BGEPA, BCC Calif: END, FP, S3 MSHCP: AC BLM: S USFS: S	Absent (foraging and nesting); no suitable habitat, not observed during surveys.
Icteria virens Yellow-breasted chat	Summer resident, inhabits riparian thickets of willow near watercourses, low dense riparian willow. Migrant and summer resident in CA, northern CA, central coast, eastern Central Valley, coastal southern CA, Colorado River, western US, Canada, Mexico, Central America. CNDDB only tracks nesting.	Fed: None Calif: SSC, S3 MSHCP: AC	Not expected (foraging and nesting); no or marginal habitat, no documented occurrences (nesting) within 5 mi., few eBird records in vicinity, not observed during surveys.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Lanius ludovicianus Loggerhead shrike	Open areas where small trees, shrubs, and fences can provide suitable perches. Nests in small trees and large shrubs. Throughout much of North America. CNDDB only tracks nesting.	Fed: BCC Calif: SSC, S4 MSHCP: AC	Occurs (foraging), moderate (nesting); observed on the site during surveys, potentially suitable nesting habitat, one documented occurrence (nesting) within 5 mi. (2007, 4.5 mi. NE).
Plegadis chihi White-faced ibis	Freshwater wetlands, shallow lakes, wet meadows, flooded pastures and croplands. Nests in dense, fresh emergent wetland. Salton Sea, local winter visitor along coast, uncommon elsewhere in southern CA and Central Valley. CNDDB only tracks nesting colonies.	Fed: None Calif: WL, S3S4 MSHCP: AC	Not expected (foraging), absent (nesting); no suitable habitat, no documented occurrences (nesting) within 5 mi., few eBird records in vicinity, not observed during surveys.
Polioptila californica Coastal California gnatcatcher	Sage scrub, also chaparral, grasslands, riparian adjacent to or mixed with sage scrub below 2,500 ft elevation. S Ventura Co. to LA, Orange, Riv., San Bern., San D. Cos into Baja CA, Mexico.	Fed: THR Calif: SSC, S2 MSHCP: AC	Occurs (foraging and nesting); observed on the site during surveys including nest sites and breeding pairs.
Selasphorus rufus Rufous hummingbird	Breeds in open or shrubby areas, forest openings, yards and parks. Sometimes forests, thickets, swamps, meadows. Elev. range 0-6000 ft. Migrating birds can be up to 12,600 ft. Wintering birds in oak, pine, and juniper woodlands. Found in Western US and Canada. Generally migrates through southern CA during pre-breeding migratory season (mid-Feb to mid-May). CNDDB only tracks nesting.	Fed: BCC Calif: SA, S1S2	Occurs (foraging), not expected (nesting); observed onsite during surveys, outside breeding range, no documented occurrences (nesting) within 5 mi.
Setophaga petechia Yellow warbler	Migrant and summer resident in southern CA. Riparian, including willow, cottonwood, sycamore, alder, aspen for nesting & foraging, also conifer forest. CNDDB only tracks nesting.	Fed: BCC Calif: SSC, S3S4	Low (foraging and nesting); potentially marginal habitat, no documented occurrences (nesting) within 5 mi., few eBird records in vicinity, not observed during surveys.
Spinus lawrencei Lawrence's goldfinch	Summer breeder, may overwinter. Coastal side of southern and central CA, western edge of southern deserts, east side of Central Valley into northern CA, Colorado River, SW US and northern Mex. Valley foothill hardwood and hardwood-conifer, desert riparian, pinyon juniper, palm oasis, lower montane. Nests in oaks, conifers. CNDDB only tracks nesting.	Fed: BCC Calif: SA, S4	Occurs (foraging), low (nesting); observed on the site during surveys, potentially suitable or marginal nesting habitat, no documented occurrences (nesting) within 5 mi.
Toxostoma redivivum California thrasher	Chaparral. Coastal and foothill areas of California and NW Baja California, Mexico. Resident throughout its range. Not tracked in CNDDB.	Fed: BCC Calif: none	Occurs (foraging), moderate (nesting); potentially suitable or marginal nesting habitat.

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Vireo bellii pusillus Least Bell's vireo	Riparian woodlands, bottomlands. N Mex. & Baja CA into S CA & the S mid-western US. CNDDB only tracks nesting.	Fed: END Calif: END, S2 MSHCP: AC a	Absent (foraging and nesting); no suitable habitat, two documented occurrences within 5 mi. (both along San Jacinto River - 2010, 4.6 mi. ENE; 2002, 4.2 mi. ENE), not observed during surveys. Habitat assessment found no suitable habitat on the site.
Xanthocephalus xanthocephalus Yellow-headed blackbird	Marsh, swamp, wetland. Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds. Nests only where large insects are abundant. CNDDB only tracks nesting.	Fed: None Calif: SSC, S3	Absent (foraging and nesting); no suitable habitat, few eBird records in vicinity, not observed during surveys.
Mammals			
Chaetodipus californicus femoralis Dulzura pocket mouse	Variety of habitats including coastal scrub, chaparral & grassland. Attracted to grass-chaparral edges. Chaparral, coastal scrub, valley and foothill grassland.	Fed: None Calif: SSC, S3	Low to moderate; potentially suitable or marginal habitat, no documented occurrences within 5 mi.
Chaetodipus (Perognathus) fallax Northwestern San Diego pocket mouse	Sandy herbaceous areas, usually in association with rocks or coarse gravel, chaparral, coastal scrub, grasslands. SW CA & NW Baja California (inland to San Bernardino Valley).	Fed: None Calif: SSC, S3S4 MSHCP: AC	Low to moderate; potentially marginal habitat, two documented occurrences within 5 mi. (1992, 3.4 mi. NE; 2009, 3.8 mi. S).
Dipodomys merriami parvus San Bernardino kangaroo rat	Alluvial floodplains and adjacent upland habitats within the San Bernardino, Menifee, and San Jacinto valleys, Riversidean alluvial fan sage scrub.	Fed: END Calif: CanE, SSC, S1 MSHCP: AC c	Absent; no suitable habitat, one documented occurrence within 5 mi. (1938, exact location unknown, mapped 4.4 mi. NNE).
Dipodomys stephensi Stephens' kangaroo rat	Sparse, gently sloping grassland, sometimes at margins of cultivated or disturbed lands; prefers grassland dominated by forbs rather than annual grasses, prefers sparse perennial vegetation; firm soil for burrowing (not too hard or too sandy); may use abandoned gopher burrows; W Riverside Co. and adjacent San Diego Co. San Bernardino County occurrences extirpated. No critical habitat has been designated.	Fed: END Calif: THR, S2 MSHCP: AC	High; potentially suitable habitat, 22 documented occurrences within 5 mi. (1938-2005, closest is 1.2 mi. N).

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Eumops perotis californicus Western mastiff bat	Lowlands (with rare exceptions), many open, semi-arid to arid habitats, conifer and deciduous woodlands, coastal scrub, grasslands, chaparral. Central & S CA, S AZ, NM, SW TX. Roosts in deep rock crevices, high buildings, trees, and tunnels; forages over wide area.	Fed: None Calif: SSC, S3S4 BLM: S	Low to moderate (foraging), low (roosting); potentially suitable foraging habitat, no or marginal roosting habitat, two documented occurrences within 5 mi. (1990, exact location unknown, mapped 2.6 mi. N; 2001, 1.5 mi. NW).
Lasiurus xanthinus Western yellow bat	Valley foothill riparian, desert riparian, desert wash, palm oasis. Roosts in trees, particularly palms. Forages over water and among trees. Desert regions of the SW US. Distributed in S CA, AZ, NM, & TX, into Mexico.	Fed: None Calif: SSC, S3	Not expected (foraging and roosting); no or marginal habitat, one documented occurrence within 5 mi. (1982, exact location unknown, mapped 2.7 mi. N).
Lepus californicus bennettii San Diego black-tailed jackrabbit	Chaparral, coastal, or Riversidean sage scrub with adjacent open grassland. Los Angeles Co. S to San Quintin, Baja California, Mexico.	Fed: None Calif: SSC, S3S4 MSHCP: AC	Occurs; observed on the site during surveys.
Neotoma lepida intermedia San Diego desert woodrat	Arid shrublands, rocky outcrops, & crevices. Cismontane CA., San Luis Obispo to San Diego Co. & NW Baja California. 0-7000 ft. elev. Variety of shrub and desert habitats, primarily associated with rock outcroppings, boulders, cacti, or areas of dense undergrowth. Constructs elaborate middens of sticks and other materials.	Fed: None Calif: SSC, S3S4 MSHCP: AC	Not expected; potentially marginal habitat, no documented occurrences within 5 mi., no middens observed during surveys.
Nyctinomops femorosaccus Pocketed free-tailed bat	Deserts & arid lowlands, pinyon juniper woodlands, desert scrub, riparian scrub, Joshua tree woodland, rocky areas with high cliffs. E Riverside & San Diego Cos. and Imperial Co., through SW US, Baja California, mainland Mexico. Roost mainly in crevices of high cliffs. Few records in So CA. Prefers rocky desert areas with high cliffs or rock outcrops. Feeds over ponds, streams, and arid desert.	Fed: None Calif: SSC, S3	Not expected (foraging and roosting); no suitable habitat, no documented occurrences within 5 mi.
Onychomys torridus ramona Southern grasshopper mouse	Nocturnal, active year-round. Desert scrub, coastal scrub, mixed chaparral, sagebrush, especially scrub habitats with friable soil, prefers low to moderate shrub cover. LA through San Diego counties and northwest Baja.	Fed: None Calif: SSC, S3	Low; potentially marginal habitat, one documented occurrence within 5 mi. (1932, exact location unknown, mapped 4.4 mi. NE).

Species	Habitat and Distribution	Conservation Status	Potential for Occurrence
Perognathus longimembris brevinasus Los Angeles pocket mouse	Nocturnal, active Apr-Aug. Annual grassland, sage scrub, alluvial sage scrub. S California from Rancho Cucamonga (W boundary), San Gorgonio (E), Aguanga & Oak Grove, San Diego (S). Open ground with fine, sandy soils.	Fed: None Calif: SSC, S1S2 MSHCP: AC c	Low; potentially marginal habitat, no documented occurrences within 5 mi.
Perognathus longimembris internationalis Jacumba pocket mouse	Desert riparian, desert scrub, desert wash, coastal scrub and sagebrush. Rarely found on rocky sites.	Fed: None Calif: SSC, S2	Low; potentially marginal habitat, no documented occurrences within 5 mi.
Taxidea taxus American badger	Mountains, deserts, interior valleys where burrowing animals are available as prey & soil permits digging. Throughout Central & W North America.	Fed: None Calif: SSC, S3	Low; potentially suitable habitat, no badger burrows or diggings observed during surveys.

References: CDFW (2021b, 2021c), USFWS (2021), Dudek (2003), RCA (2020); Cornell (2021); eBird (2021); USFS (2013).

"Documented occurrences" refers to species occurrences in the California Natural Diversity Database (CNDDB) unless otherwise noted. For plant species that are not tracked in the CNDDB, records from the Consortium of California Herbaria (CCH) may be used (only CCH records that include map coordinates are utilized). EBird (eBird.org) is an online database of bird distribution and abundance sponsored by the Cornell Laboratory of Ornithology and compiled from observations submitted by citizen scientists. eBird records of bird observations are noted but should be interpreted with caution. eBird records "in vicinity" means records within about a 5-mile radius of the site.

Federal designations: (Federal Endangered Species Act, U.S. Fish and Wildlife Service):

- END: Federally listed, endangered; an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.
- THR: Federally listed, threatened; an animal or plant which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range.
- Cand Candidate for federal listing as threatened or endangered; species that has been studied by the U.S. Fish and Wildlife Service, and the Service has concluded that it should be proposed for addition to the Federal Endangered and Threatened species list.
- Prop Proposed for federal listing as Endangered or Threatened under Section 4 of the Endangered Species Act.
- Delisted: Previously federally listed as endangered or threatened, but is no longer listed (e.g., due to recovery).
- None: The species has no federal conservation status.
- BGEPA: Federal Bald and Golden Eagle Protection Act; protects bald and golden eagles.
- BCC: USFWS Bird of Conservation Concern; migratory and non-migratory bird species (beyond those already designated as Federally threatened or endangered) that represent USFWS highest conservation priorities.

State designations: (California Endangered Species Act, California Dept. of Fish and Wildlife)

- END: State listed, endangered; a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

CanE: Candidate Endangered; a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the Fish and Game Commission has formally noticed as being under review by the Department of Fish and Wildlife for addition to the list of endangered species, or a species for which the commission has published a notice of proposed regulation to add the species to the list of endangered species.

CanT: Candidate Threatened; a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the Fish and Game Commission has formally noticed as being under review by the Department of Fish and Wildlife for addition to the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to the list of threatened species.

THR: State listed, threatened; a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.

RARE: State listed as rare: a native plant species, subspecies, or variety when, although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens (Native Plant Protection Act of 1977).

SSC: CDFW Species of Special Concern; vertebrate species of concern due to declining population levels, limited ranges, and/or continuing threats that have made them vulnerable to extinction.

FP: Fully Protected; California Fish and Game Code states that Fully Protected species "...may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected" species, although take may be authorized for necessary scientific research.

Delisted: Previously state listed as threatened or endangered, but no longer listed (e.g., due to recovery).

SA: CDFW Special Animal; wildlife of state conservation concern.

SH: All California sites are historical, still some hope of rediscovery.

SX: All California sites are historical, presumed extirpated.

PFB: Protected Fur-bearing Mammal under Title 14 of the California Code of Regulations.

None: The species has no state conservation status.

State Rank (S Rank): A reflection of the condition and imperilment of an element (plant, animal, vegetation community) throughout its range within the state. The S ranks are determined through a combination of rarity, threat, and trend factors, weighted more heavily on the rarity factors. Where correct category is uncertain, the S rank includes two categories or a question mark. Older ranks, which need to be updated, may still contain a decimal "threat" rank of .1, .2, or .3, where .1 indicates very threatened status, .2 indicates moderate threat, and .3 indicates few or no current known threats.

S1: Critically imperiled; imperiled in the state because of extreme rarity or some factor(s) making it especially vulnerable to extirpation from the state.

S2: Imperiled; imperiled in the state because of rarity due to very restricted range, very few populations, steep declines, or other factors making it very vulnerable to extirpation from the state or nation.

S3: Vulnerable; vulnerable in the state due to a restricted range, relatively few populations, recent and widespread declines, or other factors making it vulnerable to extirpation. S4: Apparently secure; uncommon but not rare, some cause for long-term concern due to declines or other factors.

S5: Secure; common, widespread, and abundant in the state.

SH: Possibly extirpated; species or community occurred historically in the state, and there is some possibility that it may be rediscovered. The element has not been seen for at least 20 years, but suitable habitat still exists.

SX: Presumed extirpated; species or community is believed to be extirpated from the state.

California Rare Plant Rank (CRPR): The *California Rare Plant Ranks* are a ranking system originally developed by the California Native Plant Society (CNPS) to better define and categorize rarity in California's plants. These ranks were previously known as the CNPS lists but were renamed to the *California Rare Plant Ranks* to better reflect the joint effort among the CNPS, the CDFW, and a wide range of botanical experts, who work together to assign a rarity ranking.

1A: Plants presumed extinct in California and rare/extinct elsewhere.
1B: Plants rare, threatened, or endangered in California and elsewhere.
2A: Plants presumed extirpated in California, but more common elsewhere.
2B: Plants rare, threatened, or endangered in California but more common elsewhere.
3: Plants about which we need more information.
4: Plants of limited distribution.
X.1: Extension to CRPR (e.g., 1B.1); seriously threatened in California.
X.2: Extension to CRPR (e.g., 1B.2); fairly threatened in California.
X.3: Extension to CRPR (e.g., 1B.3); not very threatened in California.
CBR: Considered but rejected.

U.S. Forest Service (USFS) designation:

S: Sensitive; plant and animal species identified by a regional forester that are not listed or proposed for listing under the Federal Endangered Species Act for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Bureau of Land Management (BLM designation:

S: Sensitive; plant and animal species requiring special management consideration to promote their conservation and reduce the likelihood for future listing under the Federal Endangered Species Act. Includes species designated as sensitive by the BLM State Director and all Federal Candidate species and Federal delisted species in the 5 years following delisting. Sensitive species are managed as special status species.

Western Riverside County Multiple Species Habitat Conservation Plan: Applied to species that are covered under state and federal permits for the MSHCP.

NAC: Species Not Adequately Conserved
AC: Species Adequately Conserved
(a): Surveys may be required for these species as part of wetlands mapping as described in Section 6.1.2 of the MSHCP.
(b): Surveys may be required for these species within Narrow Endemic Plant Species survey area as described in Section 6.1.3 of the MSHCP.
(c): Surveys may be required for these species within locations shown on survey maps as described in Section 6.3.2 of the MSHCP.
(d): Surveys may be required for these species within Criteria Area as described in Section 6.3.2 of the MSHCP.
(e): These Covered Species will be considered Adequately Conserved when conservation requirements identified in species-specific conservation objectives have been met. Species-specific conservation objectives for these species are presented in Section 9.0 of the MSHCP. Please refer to Table 9-3 of the MSHCP for specific conservation objectives that must be met for these species prior to including them on the list of Covered Species Adequately Conserved.
(f): These Covered Species will be considered Adequately Conserved when a Memorandum of Understanding is executed with the U.S. Forest Service that addresses management for these species on Forest Service Land. Refer to Table 9-3 of the MSHCP.
No entry: Not a Covered Species

Definitions of occurrence probability:

These definitions provide general guidance. Classifications for individual species may be modified based on biologists' experience and expert opinion.

Occurs: Species was detected during surveys or previously documented on the Project site or adjacent areas.
High: Species documented in the vicinity (i.e., within 5 miles) of the Project site and suitable habitat is present, but species not detected during surveys.
Moderate: Species documented in the vicinity of the Project site or suitable habitat present and site is within geographic and elevational range of the species.

Low:	Species not documented in the vicinity of the Project site or suitable habitat is marginal.
Not Expected:	Species not documented in the vicinity of the Project site and suitable habitat marginal or absent, or site is not within geographic and elevational range of the species.
Absent:	No potential for the species to occur due to lack of habitat, geographic or elevation range, species life history, survey results, etc.
Unknown:	No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

APPENDIX C: PRECIPITATION DATA

Precipitation data from the Clark Remote Automatic Weather Station for October 2002 through September 2021, by water year (October 1 through September 30) (WRCC 2021).

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2003	0.07	0.79	1.83	0.02	5.08	2.99	1.70	0.33	0.06	0.06	0.04	0	12.97
2004	0	0.92	0.62	0.29	3.22	0.92	0.39*	*	*	*	0.60*	0*	6.96*
2005	4.96	0.64	2.41	5.39	6.45	1.10	0.57	0.29	0.04	*	0.01*	0.37*	22.23*
2006	1.12	1.12*	0.35	0.62	1.59	1.55	1.32	0.28	0	0.25	0	0	8.20*
2007	0.03	0.05	0.70	0.16	0.42	0.38	0.49	0.03	0	0	0	0.03	2.29
2008	0.20	1.82	0.70	2.61	0.79	0.59	0.03	0.49	0.01	0	0	0	7.24
2009	0	1.18	2.83	0.05	0.95	0.03	0	0	0	0	0	0.01	5.05
2010	0	0.10	1.68	6.01	1.83	0.21	0.87	0.01	0	0	0	0.11	10.82
2011	0.48	0.55	8.23	0.38	2.37	1.44	0.19	0.22	0	0.29	0	0	14.15
2012	0.22	1.34	0.33	0.45	0.56	1.09*	1.17	0.02	0	0.15	0.46	0.04	5.83*
2013	0.16	0.40	2.02	0.58	0.93	0.59	0	0.29	0	0.04	0.12	0	5.13
2014	0.66	0.94	0.34	0	1.25	0.59	0.58	0	0	0	0.20	0	4.56
2015	0.20	0.23	3.18	0.68	0.47	0.73	0.17	0.97	0	0.99	0	0.75	8.37
2016	0.42	0.29	0.35	2.35	0.14	0.72	1.20	0.27	0	0	0	0.03	5.77
2017	0.64	1.10*	3.44	4.44	2.36	0.07	0	0.07	0	0.03	0.24	0	12.39*
2018	0	0.09	0	1.85	0.27	1.13	0.01	0.20	0	0	0	0	3.55
2019	1.02	1.08	1.33	2.27	4.37	1.96	0.02	0.87	0	0	0	0	12.92
2020	0	2.19	2.69	0.04	0.32	3.65	3.73	0	0.04	0	0	0	12.66
2021	0	0.14	1.18	2.00	0.01	1.30	0	0*	0.07*	0.10	0	0.16	4.96*

*missing or suspect data.

Precipitation data from the Sage Remote Automatic Weather Station for October 2010 through September 2021[4], by water year (October 1 through September 30) (WRCC 2021).

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2011	1.13	0.96	7.73	0.52	4.12	1.65	0.32	0.48	0.04	0.52	0	0.02	17.49
2012	0.89	2.02	0.95	0.55	1.88	1.65	1.68	0.04	0	0.22	2.06	0.15	12.09
2013	0.16	0.39	1.74	0.83	1.27	1.04	0.06	0.51	0	0.01	0.20	0.13	6.34
2014	0.90	0.62	0.45	0.04	1.69	0.69	0.32	0	0	0	1.22	0.56	6.49
2015	0.10	0.77	4.22	0.68	0.87	0.70	0.18	1.99	0	1.36	0	0.85	11.72
2016	0.57	0.59	1.23	3.10	0.11*	0.93	0.40	0.11	0	0	0	0.75	7.79*
2017	0.19	1.20	4.18	4.97	4.05	0.13	0	0.42	0	0.01	0.18	0.06	15.39
2018	0.02	0.09	0	2.63	0.46	2.35	0	0.12	0.01	0.04	0	0	5.72
2019	0.92	1.18	1.61	2.54	7.34	1.84	0.20	1.41	0.02	0	0	0.10	17.16
2020	0	3.01	2.39	0.53	0.40	4.78	4.44	*	0.04	0.01	0	0	15.60*
2021	0.09	0.62	1.43	1.62	0.20	1.54	0.31	0	0	0.31	0	0.07	6.19

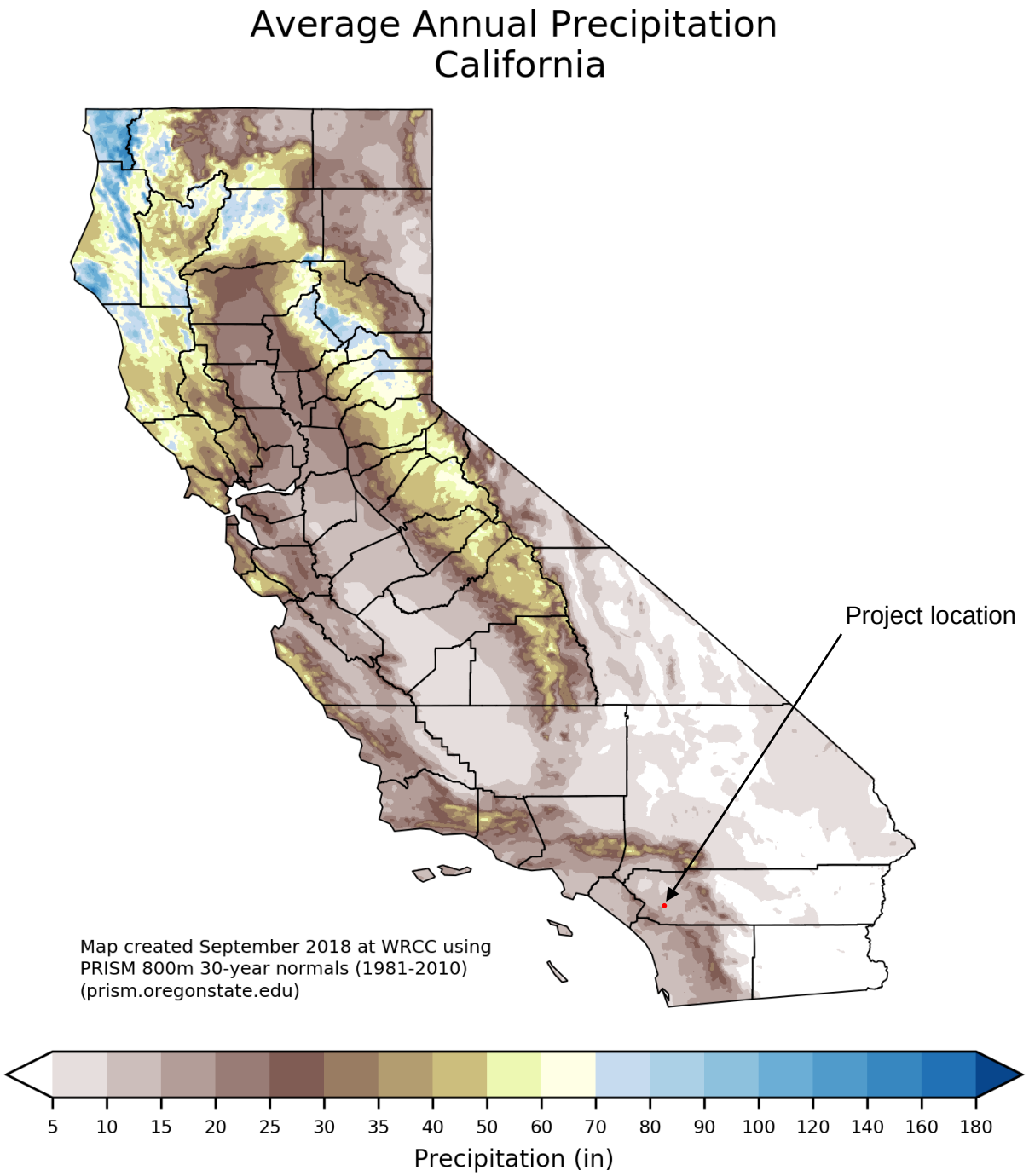
*missing or suspect data.

[4] The record for the Sage Weather Station begins in 2010.

Precipitation data from the Cranston Remote Automatic Weather Station for October 2002 through September 2021, by water year (October 1 through September 30) (WRCC 2021).

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2003	0.01	1.41	2.62	0.08	4.18	3.26*	1.71	0.12	0.08	0.37	0.10	0.08	14.02*
2004	0	2.18	0.83	0.33	3.72	2.86	0.97	0.02	0	0*	0.02	0	10.93*
2005	6.34	1.85	3.83	8.17	5.38	1.20	1.58	0.85	0	1.38	1.42	0.17	32.17
2006	1.46	0	0.22	0.92	2.06	3.15	2.29	0.32	0	0.33	0	1.02	11.77
2007	0.21	0.07	0.45	0.24	1.95	0.25	0.69	0.03	0	0.01	0.04	0.20	4.14
2008	0	2.31	1.36	4.77	1.92	0.47	0	1.21*	0*	0.15*	0*	0*	12.19*
2009	0*	0.39*	0.26*	0.34*	1.56*	0.03*	0.62*	0.08*	0.03*	0*	0*	0.02*	3.33*
2010	0.04*	0.26*	0.57*	2.80*	2.42*	0.80*	0.76*	0*	0*	0.10*	0.39	0.04	8.18*
2011	2.09	1.14	8.98	0.74	3.83	1.69	0.19	0.23	0.03	0.48	0	0.03	19.43
2012	0.33	2.33	0.53	0.38	1.77	1.71	1.45	0.03	0	0.03	2.30	0.89	11.75
2013	0.26	0.16	1.39	1.15	0.98	1.29	0.08	0.22	0	0	0.57	0.21	6.31
2014	0.74	0.58	0.31	0.01	2.23	1.35	0.60	0.01	0	0.32	1.35	2.09	9.59
2015	0.06	0.55	4.53	0.25	0.81	0.84	0.35	1.94	0.31	3.54	0	0.82	14.00
2016	0.85	0.47	1.66	3.41	0.12*	0.80	0.39	0.84	0	0	0.03	0.68	9.25*
2017	0.55*	1.26	4.21	5.56	3.93	0.21	0	0.41	0.01	0	0.21	0	16.35*
2018	0.01	0.06	0	2.15	0.62	2.79	0.01	0.28	0	0.28	0	0	6.2
2019	0.87	0.80	1.74	3.05	9.02	2.07	0.32*	1.87	0.01	0	0	0.08	19.83*
2020	0	3.38	2.44	0.34	0.54	5.04	3.85	0.06	0.03	0	0.21	0	15.89
2021	0	0.52	1.39	2.39	0.28	1.33	0.36	0.05	0.03	0.37	0	0.03	6.75

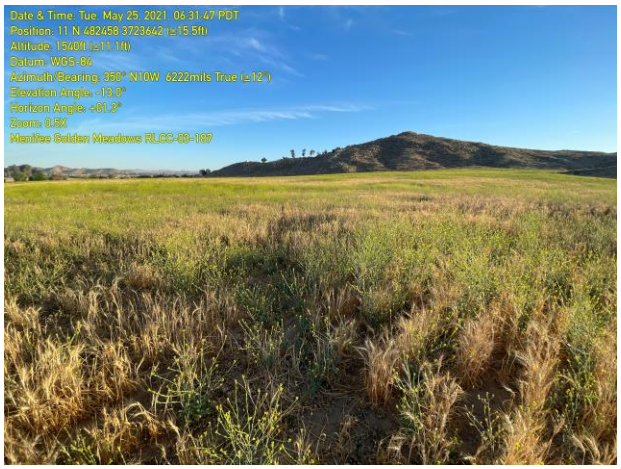
*missing or suspect data.



From WRCC (2018)

APPENDIX D: SITE PHOTOGRAPHS

Agricultural fields, south-central area of site facing northwest (05.25.2021).



Agricultural fields, central area of site facing north; slopes with coastal scrub visible in background (05.25.2021).

Agricultural fields after mowing, south-central area of site facing east (11.08.2021).

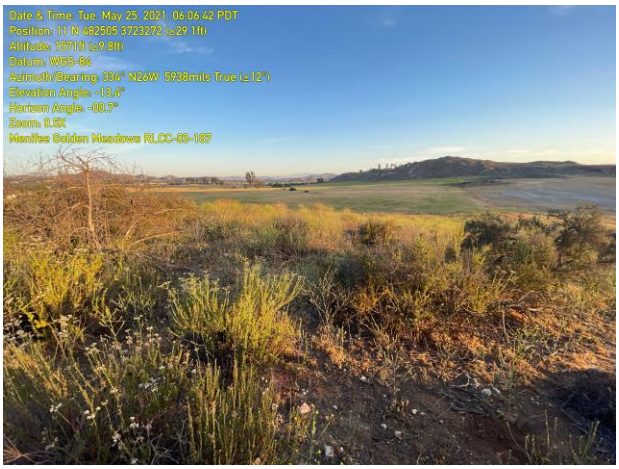
Overview of site after agricultural fields mowed, from slope at north-central edge of site facing south; coastal scrub in foreground (11.08.2021).

California buckwheat scrub, northeastern area of site facing south (05.21.2021).

California buckwheat scrub, northeastern corner of site facing southwest (05.21.2021).

California buckwheat scrub/ruderal, east-central area of site facing southeast (05.21.2021).

California buckwheat scrub/ruderal, northwest area of site facing south (05.25.2021).

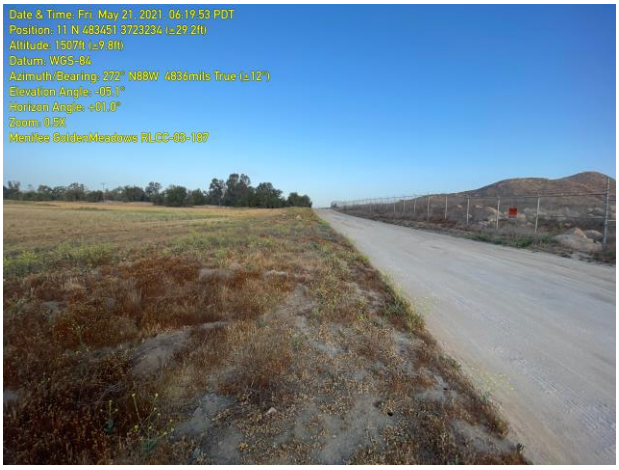


Chamise chaparral, south-central edge of site facing northwest (05.25.2021).

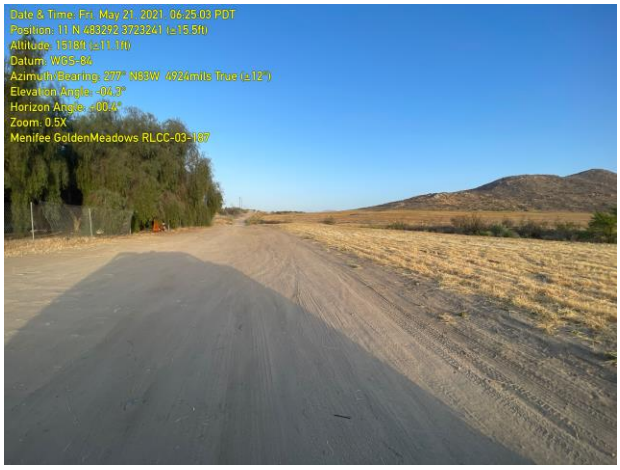
Area of chamise chaparral after it was mowed, south-central edge of site facing west (11.08.2021).

Scattered riparian vegetation along blue-line stream, northwest area of site facing southeast (11.08.2021).

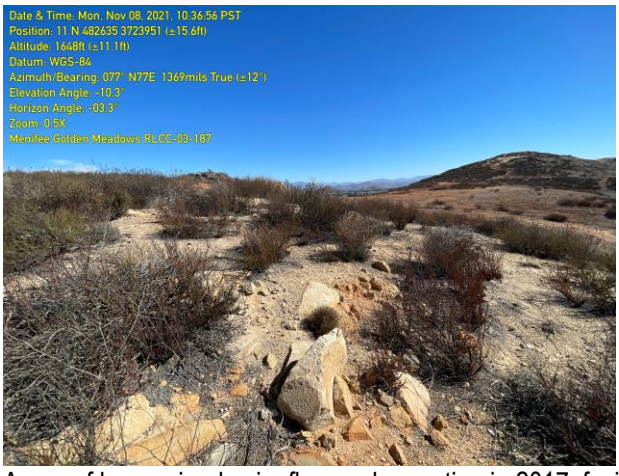
Scattered riparian vegetation along blue-line stream, northwest-central area of site facing north (11.08.2021).



Offsite area along Wickerd Road, facing west (05.21.2021).



Offsite area along Wickerd Road, facing west (05.21.2021).



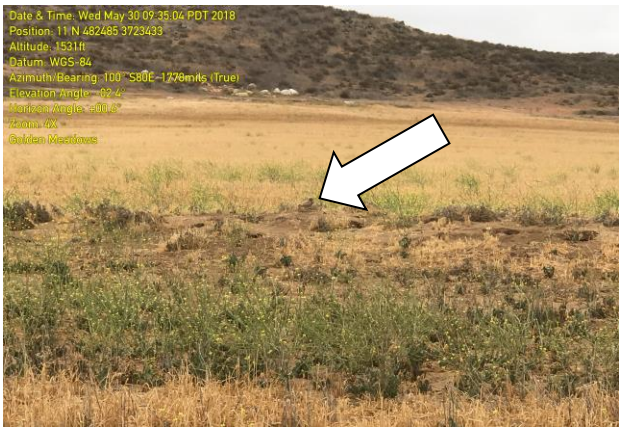
Areas of long-spined spineflower observation in 2017, facing east (11.08.2021). This area has been impacted by OHV use and the species was not observed during surveys in 2018, 2019, and 2021.

Southern California black walnut tree in riparian area, facing north (11.08.2021).

Southern California black walnut tree in riparian area, facing northwest, eucalyptus tree at right (11.08.2021).

Non-native pepper trees along western boundary of site, facing north (05.25.2021). Tree on left is offsite.

Scattered trees in the riparian area, facing south (05.25.2021).



Burrowing owl observed onsite on May 30, 2018. The owl was not observed during subsequent surveys in 2018. No owls or owl sign were observed during surveys in 2019 and 2021.

Burrowing owl burrow in 2018. This burrow was not occupied during surveys in 2019 and 2021.

Location of 2018 burrow in 2021 after agricultural fields were mowed, facing south (11.08.2021). There was no evidence of occupation before or after mowing.

Potentially suitable burrow with no signs of occupation, after agricultural fields mowed, southeast area of site facing east (11.08.2021).

Potentially suitable habitat for burrowing owl and potential burrow locations were thoroughly searched and no evidence of occupation was found in 2019 and 2021.

APPENDIX E: CNDDB FORMS

CNDDB forms for 2021 observations are provided below. The forms were submitted to CDFW online. The CNDDB only tracks nesting for Cooper's hawk and nesting was not observed, so a CNDDB form for this species is not required. The CNDDB does not track Nuttall's woodpecker or wrentit, so CNDDB forms for these species are not required.

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0015
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Lepus californicus bennettii*

Common name: San Diego black-tailed jackrabbit

Date of field work (mm-dd-yyyy): 05-25-2021

Comment about field work date(s):

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist

Identification explanation:

Identification confidence: Very confident

Species found: Yes **If not found, why not?**

Level of survey effort: General biological survey

Total number of individuals: 1

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
1				

Age class comment:

Site use description:

What was the observed behavior?

Describe any evidence of reproduction:

Submitted: 11/09/2021 BRU21F0015 Page 1 of 2

SITE INFORMATION

Habitat description: California buckwheat scrub adjacent to agricultural fields (dry farmed wheat)

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability: Fair

Immediate & surrounding land use: Agriculture

Visible disturbances:

Threats: Planned development

General comments:

MAP INFORMATION

ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Riverside	Romoland	1563	33.65359	-117.18804	482565	3723765	11

ID	Public Land Survey	Feature Comment
1	S T06S R03W 15	

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Mapping notes:

Location/directions comments:

Attachment(s):

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0019
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Polioptila californica californica*

Common name: coastal California gnatcatcher

Date of field work (mm-dd-yyyy): 06-07-2021

Comment about field work date(s): Species also observed at this location on 05.31.2021

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist holding a USFWS permit for this species.

Identification explanation:

Identification confidence: Very confident

Species found: Yes **If not found, why not?**

Level of survey effort: General biological survey

Total number of individuals: 3

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
3				

Age class comment: 2 adult males and 1 adult female observed

Submitted: 11/09/2021 BRU21F0019 Page 1 of 3

Bird site use:

☐ Nesting ☐ Rookery ☐ Nesting colony ☐ Burrow site ☐ Lek
☐ Non-breeding (over-wintering) ☐ Communal roost ☑ Other

Site use description: Foraging, nesting not observed

What was the observed behavior? Foraging

Describe any evidence of reproduction:

SITE INFORMATION

Habitat description: California buckwheat scrub

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability:

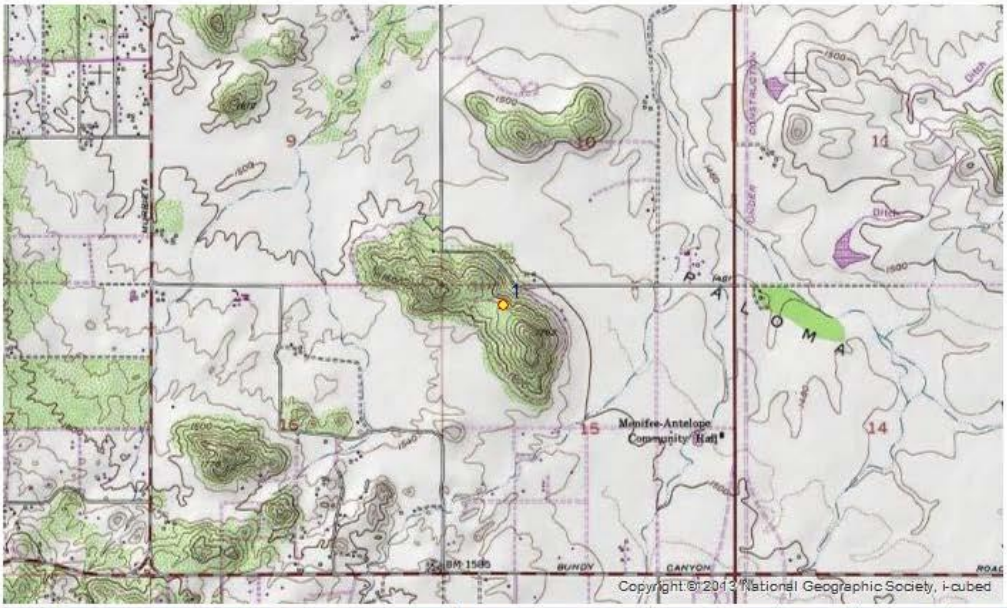
Immediate & surrounding land use: Agriculture

Visible disturbances: OHV trails

Threats: Planned development

General comments: CNDDB EO#736

MAP INFORMATION



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Riverside	Romoland	1643	33.65496	-117.18490	482855	3723916	11
1	**Public Land Survey**	**Feature Comment**						
	S T06S R03W 15							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Mapping notes:

Location/directions comments:

Attachment(s):

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0018
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Eremophila alpestris actia*

Common name: California horned lark

Date of field work (mm-dd-yyyy): 05-25-2021

Comment about field work date(s):

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist

Identification explanation:

Identification confidence: Very confident

Species found: Yes **If not found, why not?**

Level of survey effort: General biological survey

Total number of individuals: Flock of several

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
Several				

Age class comment:

Bird site use:

☐ Nesting ☐ Rookery ☐ Nesting colony ☐ Burrow site ☐ Lek
☐ Non-breeding (over-wintering) ☐ Communal roost ☑ Other

Site use description: Foraging

What was the observed behavior? Foraging

Describe any evidence of reproduction:

SITE INFORMATION

Habitat description: Agricultural field (dry farmed wheat)

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability:

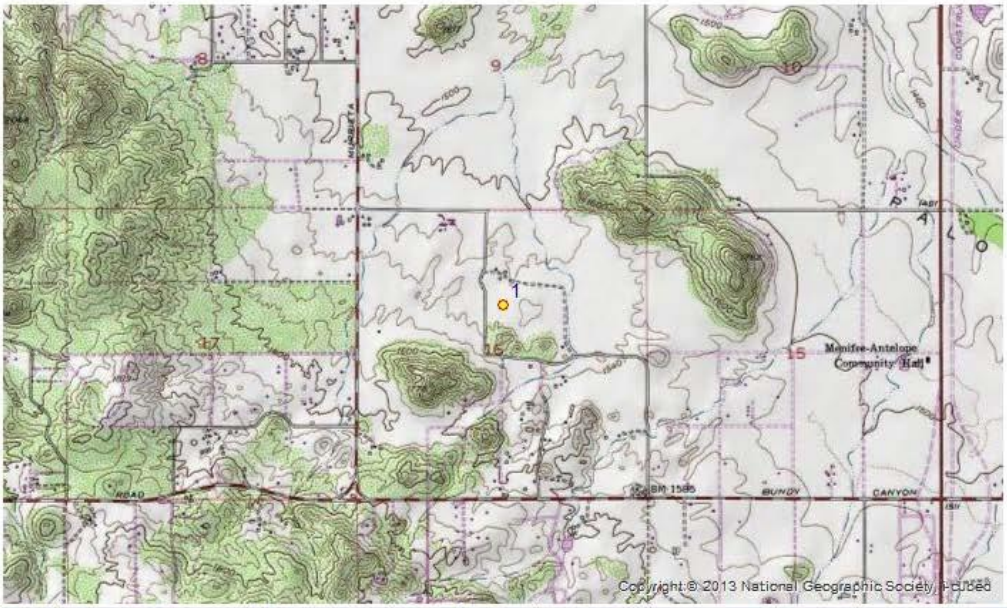
Immediate & surrounding land use: Agriculture

Visible disturbances:

Threats: Planned development

General comments:

MAP INFORMATION



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Riverside	Romoland	1537	33.65118	-117.19723	481711	3723499	11
1	**Public Land Survey**	**Feature Comment**						
	S T06S R03W 16							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Mapping notes:

Location/directions comments:

Attachment(s):

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
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This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0017
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Eremophila alpestris actia*

Common name: California horned lark

Date of field work (mm-dd-yyyy): 06-05-2021

Comment about field work date(s): Also observed on 05.21.2021

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist

Identification explanation:

Identification confidence: Very confident

Species found: Yes **If not found, why not?**

Level of survey effort: General biological survey

Total number of individuals: Flock of several

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
Several				

Age class comment:

Bird site use:

☐ Nesting ☐ Rookery ☐ Nesting colony ☐ Burrow site ☐ Lek
☐ Non-breeding (over-wintering) ☐ Communal roost ☑ Other

Site use description: Foraging

What was the observed behavior? Foraging

Describe any evidence of reproduction:

SITE INFORMATION

Habitat description: Agricultural field (dry farmed wheat)

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability:

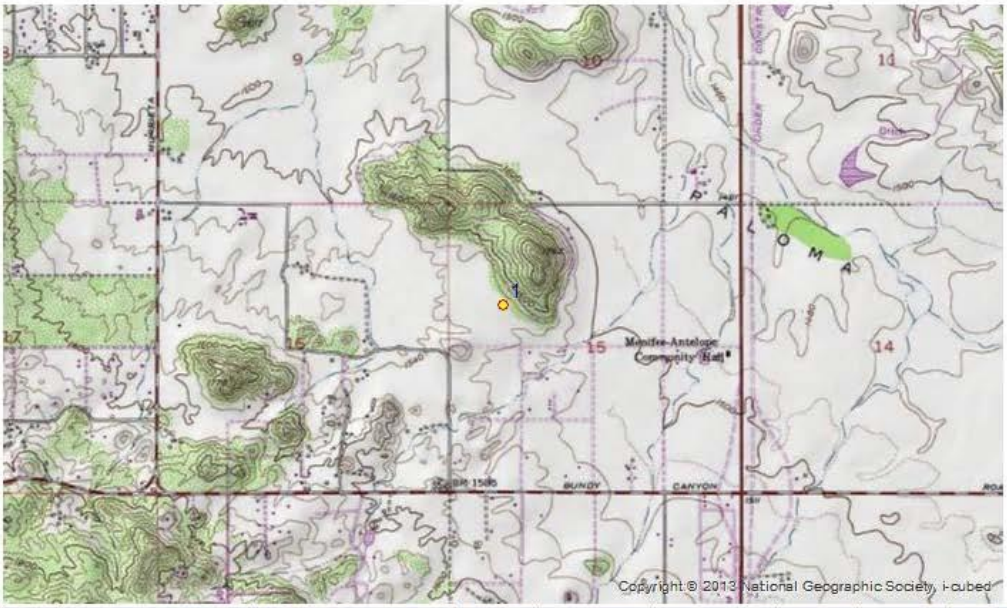
Immediate & surrounding land use: Agriculture

Visible disturbances:

Threats: Planned development

General comments:

MAP INFORMATION



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Riverside	Romoland	1558	33.65088	-117.18529	482819	3723463	11
1	**Public Land Survey**	**Feature Comment**						
	S T06S R03W 15							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Submitted: 11/09/2021 BRU21F0017 Page 2 of 3

Mapping notes:

Location/directions comments:

Attachment(s):

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1416 9th Street, Suite 1266
Sacramento, CA 95814
Fax: 916.324.0475
cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BRU21F0016
Quad code 3311762
Occ. no.
EO index no.
Map index no.

Scientific name: *Eremophila alpestris actia*

Common name: California horned lark

Date of field work (mm-dd-yyyy): 07-06-2021

Comment about field work date(s):

OBSERVER INFORMATION

Observer: Guy Bruyea

Affiliation: L&L Environmental, Inc.

Address: 700 E. Redlands Blvd, Suite U-351 , Redlands, CA 92373

Email: cwakeman@llenviroinc.com

Phone: (909) 335-9897

Other observers:

DETERMINATION

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: Identified by experienced field biologist

Identification explanation:

Identification confidence: Very confident

Species found: Yes **If not found, why not?**

Level of survey effort: General biological survey

Total number of individuals: Flock of several

Collection? **Collection number:**

Museum/Herbarium:

ANIMAL INFORMATION

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
Several				

Age class comment:

Bird site use:

☐ Nesting ☐ Rookery ☐ Nesting colony ☐ Burrow site ☐ Lek
☐ Non-breeding (over-wintering) ☐ Communal roost ☑ Other

Site use description: Foraging

What was the observed behavior? Foraging

Describe any evidence of reproduction:

SITE INFORMATION

Habitat description: Agricultural fields (dry farmed wheat)

Slope: Land owner/manager: Private

Aspect:

Site condition + population viability:

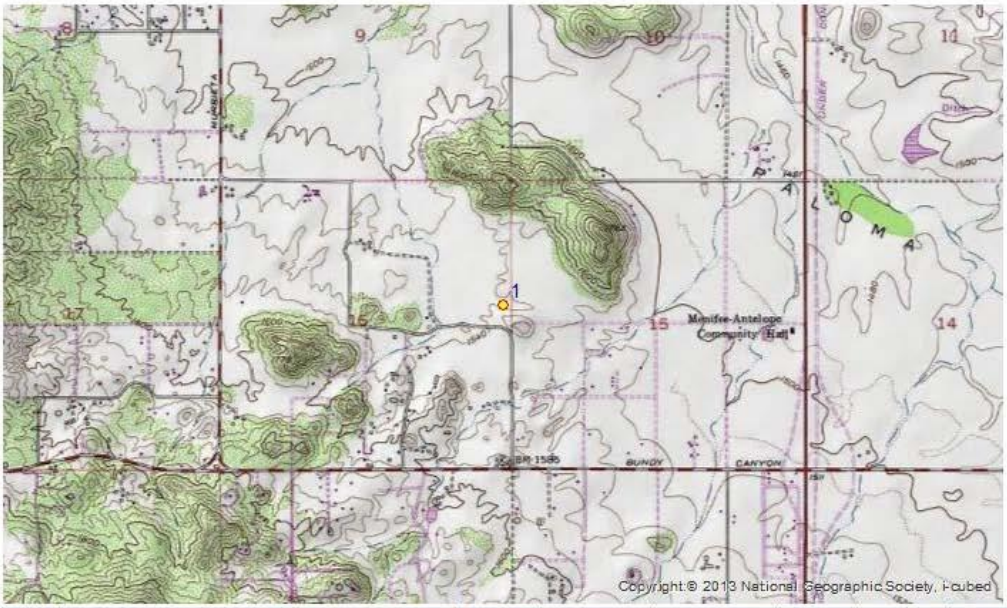
Immediate & surrounding land use: Agriculture

Visible disturbances:

Threats: Planned development

General comments:

MAP INFORMATION



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTME NAD83	UTMN NAD83	UTM Zone
	Riverside	Romoland	1542	33.64972	-117.18907	482468	3723335	11
1	**Public Land Survey**	**Feature Comment**						
	S T06S R03W 16							

The mapped feature is accurate within: 5 m

Source of mapped feature: GPS app on phone

Submitted: 11/09/2021 BRU21F0016 Page 2 of 3

Mapping notes:

Location/directions comments:

Attachment(s):

APPENDIX F: RIVERSIDE COUNTY DOCUMENTATION

Certification

Certification: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: March 18, 2022 SIGNED: _____

Leslie Irish, Principal, L&L Environmental, Inc.
909-335-9897

1) Fieldwork Performed By:

Guy Bruyea
Name

2) Fieldwork Performed By:

John Konecny
Name

3) Fieldwork Performed By:

_____
Name

4) Fieldwork Performed By:

_____
Name

5) Fieldwork Performed By:

_____
Name

6) Fieldwork Performed By:

_____
Name

Check here __ if adding any additional names / signatures below or on other side of page.

BIOLOGICAL REPORT SUMMARY SHEET

Applicant Name: Richland Communities
Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001
Section, Township and Range: Sections 15 and 16, Township 6 South, Range 3 West
Building and Safety Log Number: _____
Case Number: TR 31194 Lot/Parcel _____ EA Number _____

MARK ITEM(S) SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE of CONCERN	*(Mark Yes, No, or N/A regarding species findings on the referenced site)*		
		Yes	**No**	**n/a**
	Arroyo Southwestern Toad			X
X	Blue-line Stream(s)	X		
X	Burrowing Owl	X (2018)	X (2021)	
	Coachella Valley Fringed-toed Lizard			X
X	Coastal California Gnatcatcher	X		
X	Coastal Sage Scrub	X		
	Delhi Sands Flower-loving Fly			X
	Desert Pupfish			X
	Desert Slender Salamander			X
	Desert Tortoise			X
	Flat-tailed Horned Lizard			X
X	Least Bell's Vireo (habitat)		X	
X	Oak Woodlands		X	
X	Quino Checkerspot Butterfly (2004 survey)		X	
X	Riverside Fairy Shrimp (habitat)		X	
X	Santa Ana River Woolystar		X	
	San Bernardino Kangaroo Rat			X
X	Slender-horned Spineflower		X	
	Stephens' Kangaroo Rat			X
X	Vernal Pools		X	
X	Wetlands	X		
X	Long-spined spineflower	X (2017)	X (2021)	
X	Southern California black walnut	X		
X	Coast Horned Lizard (previous survey)	X		
X	Orange-throated Whiptail (previous survey)	X		
X	Coastal (Western) Whiptail (previous survey)	X		
X	Cooper's Hawk	X		
X	Northern Harrier (previous survey)	X		
X	White-tailed Kite (previous survey)	X		
X	California Horned Lark	X		
X	Great Egret (previous survey)	X		
X	Great Blue Heron (previous survey)	X		
X	Lawrence's Goldfinch (previous survey)	X		
X	Loggerhead Shrike (previous survey)	X		
X	California Thrasher (previous survey)	X		

MARK ITEM(S) SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE of CONCERN	*(Mark Yes, No, or N/A regarding species findings on the referenced site)*		
		Yes	No	n/a
X	Southern California Rufous-crowned Sparrow (previous survey)	X		
X	Bell's Sage Sparrow (previous survey)	X		
X	Nuttall's Woodpecker	X		
X	Wrentit	X		
X	Costa's Hummingbird (previous survey)	X		
X	Rufous Hummingbird (previous survey)	X		
X	San Diego Black-tailed Jackrabbit	X		

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened, or candidate species by either state, or federal regulations, or for Riverside County as listed by the California Department of Fish and Wildlife Natural Diversity Data Base (CNDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report or habitat assessment.

L & L Environmental, Inc. — Signature and Company Name

March 18, 2022 — Date

_____ — 10(a) Permit Number (if applicable)

_____ — Permit Expiration Date

County Use Only

Received By: _____ Date: _____

PD-B# _____

Attachment E-4

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources

Case Number: TR 31194 Lot/Parcel No. _____ EA Number _____

Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001

Date: March 18, 2022

Biological Resources: (Check the level of impact that applies to the following questions.)

Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?

☐ ■ ☐ ☐

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?

☐ ■ ☐ ☐

c) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, or U. S. Wildlife Service?

☐ ■ ☐ ☐

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

☐ ■ ☐ ☐

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources

e) Have a substantial adverse effect on any riparian habitat, or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife, or the U.S. Fish and Wildlife Service?

☐ ■ ☐ ☐

f) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption)?

☐ ■ ☐ ☐

g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

☐ ■ ☐ ☐

Findings of Fact:

The site is located within the area covered by the MSHCP but is not within the Criteria Area. There is one area of PQP Conserved Lands approximately 0.68 miles north-northeast of the site (Ringing Rock Archaeological Site). Other than the Ringing Rock Site, there are no other PQP or MSHCP Conserved Lands within a mile of the site. The site is not within or near any MSHCP Core Areas or Linkages.

There is one sensitive vegetation community present, arroyo willow thicket.

No state or federally listed plants were observed. Two special status plant species were observed, long-spined spineflower and southern California black walnut.

There is one immature coast live oak and other native and non-native trees present.

Coastal California gnatcatcher present and nesting on the site. White-tailed kite observed during previous surveys, but no nesting detected.

No vernal pools or ponding areas and no fairy shrimp habitat.

Riparian birds (least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo) considered absent.

Special status wildlife species detected: orange-throated whiptail, coastal (western) whiptail, coast horned lizard, Cooper's hawk, southern California rufous-crowned sparrow, great egret, great blue heron (fly over), Bell's sage sparrow, burrowing owl, Costa's hummingbird, wrentit, northern harrier, Nuttall's woodpecker, California horned lark, loggerhead shrike, rufous hummingbird, Lawrence's goldfinch, California thrasher, and San Diego black-tailed jackrabbit.

One (1) adult burrowing owl and an occupied burrow observed in 2018. No owls or owl sign observed in 2019 or 2021.
There is habitat suitable for nesting birds (including raptors) within and adjacent to the site.

The site is not within or adjacent to a wildlife corridor.

A mapped blue-line stream is present and includes MSHCP riparian/riverine habitat as well as state waters/wetlands and federal waters. Regulatory permitting and a DBESP will be required.

Proposed Mitigation:

Preconstruction surveys for burrowing owl.

Preconstruction surveys for nesting birds during nesting season.

Avoidance of riparian habitat and offsite compensation for impacts.

Monitoring Recommended:

Monitoring of active coastal California gnatcatcher nest sites during Project activities recommended.

Monitoring of Project activities that disturb vegetation or soil in and adjacent to the Avoidance/Compatible Use Area is recommended.

Source: CGP Fig. VI.36-VI.40
Revised October 1999

APPENDIX G: SITE PLAN

L&L ENVIRONMENTAL, INC.
REGULATORY SERVICES
BIOLOGICAL & CULTURAL INVESTIGATIONS & MONITORING

UPDATED JURISDICTIONAL DELINEATION FOR TR 31194, GOLDEN MEADOWS, CITY OF MENIFEE, CALIFORNIA

±204.65-Acre Property, ±4.68 Acres Offsite, ±209.33 Acres Surveyed

APNs 360-300-002, -003, -004, -005, -006, -009, 360-350-001, and portions of offsite 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -024, 360-360-009, -010, -011, and 360-380-004, Tract 31194, Township 6 South, Range 3 West, Sections 15 and 16, USGS Romoland, 7.5' Topographic Quadrangle

Prepared For:

Brian Hardy
Richland Communities
3161 Michelson Drive, Suite 425
Irvine, CA 92612
949-261-7010

Prepared By:

Leslie Irish, Principal	lirish@llenviroinc.com
Guy Bruyea, Biological Investigator	gbruyea@llenviroinc.com
Carla Wakeman, Senior Biologist	cwakeman@llenviroinc.com
Jeffrey Sonnentag, Technical Editor	jsonnentag@llenviroinc.com

Report Summary:

The jurisdictional areas identified on the property include 18,814 sq. ft. (0.43 acre) of ephemeral unvegetated CDFW state waters/streambed (which is also MSHCP Riverine habitat) and 40,451 sq. ft. (0.93 acres) of CDFW state wetland (which is also MSHCP Riparian habitat). Construction of the proposed project will impact 9,541 sq. ft. (0.22 acre) of CDFW state water/streambed (which is also MSHCP Riverine habitat) and 5,702 sq. ft. (0.13 acre) of CDFW state wetland (which is also MSHCP Riparian habitat). The survey also identified 4,397 sq. ft. (0.10 acre) of USACE Waters of the U.S., none of which is USACE federal wetland. The development plan indicates impacts to 1,301 sq. ft. (0.03 acre) of USACE Waters of the U.S. Remaining jurisdictional areas on the site will be incorporated into a Compatible Use Area.

Surveys Conducted By: Leslie Irish
Surveys Conducted On: February 7, 2018, May 4, 2019, May 21 and June 5, 2021
Report Date: March 2022

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MANAGEMENT SUMMARY

L&L Environmental, Inc. conducted a reconnaissance survey and desktop analysis of Richland Communities ±209.33-acre project (and associated offsite improvement areas) in the City of Menifee, California. The purpose of this work effort was to update and verify a jurisdictional delineation conducted on the subject property by L&L in 2011 and 2019. A recent biological assessment (L&L 2021) addressed other biological resources on the project site and relevant information from that report is included herein.

The purpose of a (preliminary) jurisdictional delineation is to quantify the portion of a property that is subject to the jurisdiction of the U. S. Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW), and the Regional Water Quality Control Board (RWQCB). A jurisdictional determination is performed to map the wetlands and non-wetland waters that may be subject to regulation by the state or federal agencies, and that may require permits prior to disturbance/construction. All jurisdictional delineations are considered preliminary until verified and accepted by the agencies.

Land use varies within and adjacent to the survey area and includes anthropogenic disturbances such as rural residential areas, active and fallow agricultural areas, unimproved roads, power line easements, off-road vehicle activity, debris piles, and windblown debris. Two unimproved roads are present on the property.

A mapped blueline stream trending from south to north is present within the central portion of the site as well as various other jurisdictional features. No vernal pools or other areas of potential habitat for fairy shrimp are present on the site.

The jurisdictional areas identified on the property include 18,814 sq. ft. (0.43 acre) of ephemeral unvegetated CDFW state waters/streambed (which is also MSHCP Riverine habitat) and 40,451 sq. ft. (0.93 acres) of CDFW state wetland (which is also MSHCP Riparian habitat). Construction of the proposed project will impact 9,541 sq. ft. (0.22 acre) of CDFW state water/streambed (which is also MSHCP Riverine habitat) and 5,702 sq. ft. (0.13 acre) of CDFW state wetland (which is also MSHCP Riparian habitat).

The survey also identified 4,397 sq. ft. (0.10 acre) of USACE Waters of the U.S. (WoUS), none of which is USACE federal wetland. The development plan indicates impacts to 1,301 sq. ft. (0.03 acre) of WoUS.

Per conversation with the agencies, the project proposes to incorporate 9,273 sq. ft. (0.21 acre) of state streambed and 34,749 sq. ft. (0.80 acre) of state wetland, which is also MSHCP Riparian/Riverine habitat, and includes 3,096 sq. ft. (0.07 acre) of WoUS into the onsite Compatible Use Area.

Permits/agreements and a Determination of Biological Equivalence or Superior Preservation (DBESP) according to the Western Riverside County MSHCP will be required before project-related impacts occur.

This document has been prepared to assist in planning and to accompany permit applications or agreements under federal or state law.

1.0) INTRODUCTION

The following report was prepared by L&L Environmental, Inc. (L&L) for Richland Communities. It describes the results of a 2011 jurisdictional delineation conducted on a proposed development located on lands within the City of Menifee as well as 2018/2019 and 2021 reconnaissance surveys and desktop analyses that were undertaken to update and verify the results. This report was prepared to accompany notifications or applications to the U. S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) for permits or agreements under applicable federal and state laws. The project site consists of APNs 360-300-002, -003, -004, -005, -006, -009, and 360-350-001 (totaling ±204.65 acres) and portions of offsite APNs 360-180-009, 360-300-001, -008, 360-350-019, -022, -023, -24, 360-360-009, -010, -011 and 360-380-004 (totaling ±4.68 acres) where improvements are planned.

Our assessment consisted of (1) a review of the jurisdictional delineation conducted by L&L in 2011 (L&L 2012) and 2018/2019 (L&L 2019) and other available information regarding the drainages, and (2) field reconnaissance surveys and desktop analyses, intended to verify and update information in the previous jurisdictional delineations.

1.1) Location

The site is located in the City of Menifee, in Paloma Valley west of Interstate Highway 215 (I-215), south of Newport Road, and east of Murrieta Road (Figure 1). The site is located between Wickerd Road to the south and Garbani Road to the north. The project site is situated in Sections 15 and 16, Township 6 South, Range 3 West, within the USGS Romoland 7.5' series quadrangle map (Figure 2).

The site is generally bounded as follows: to the west by agricultural lands, Evans Road (unimproved), rural residential units and a school; to the east by a mixture of disturbed and relatively undisturbed vacant land, Sherman Road (unimproved), and a Frontier Communications complex beyond; to the north by a mixture of disturbed and relatively undisturbed vacant lands, rural residential areas, Garbani Road (unimproved) and residential developments; and to the south by Wickerd Road (unimproved), rural residential areas and a mix of disturbed and relatively undisturbed lands.

In addition to the main site, offsite improvements areas are included in the project. These are comprised of three separate areas: 1) a 0.5 mile section of Wickerd Road between the

southeast corner of the main site east to Haun Road; 2) an area south of the south-central portion of the main site boundary roughly located between the intersection of Wickerd Road and Bradley Road west to an area just west of Krubsack Road, and 3) an area near the northwest portion of the main site, including Daniel Road to approximately Evans Road to the west with a small area north of and along the northwestern site boundary.

1.2) Proposed Project Description

The Project is identified as Golden Meadows (formerly known as Menifee Assemblage), Tract No. 31194, and consists of construction of 572 single-family residential lots and associated roads and infrastructure (Figure 3). The Project will be constructed in four (4) phases. Offsite impacts include improvements to existing roads and installation of flood control structures. Approximately 32.3 acres in the northeastern portion of the will be designated as a natural open space area. An Environmental Impact Report for the Project was published in 2006 (T&B 2006).

The property also includes an Eastern Municipal Water District (EMWD) tank site. The proposed tank site includes two large water tanks and an access road. The tanks will serve multiple developments, including Golden Meadows. The tank site is located within the tract boundary, but it is not within the proposed Project boundary and is not a part of the Project.

1.3) Project Setting

Much of the subject property has been disturbed in association with historic and current dryland farming and sheep grazing. As a result, these areas do not support native habitat communities. In the historically less disturbed areas of the property, remnants of California buckwheat scrub and chamise chaparral vegetation is present.

A shallow drainage feature and mapped blue-line stream is present trending from the southwest/central to the northwest portion of the site. Much of this area has been impacted by agricultural activities and invasive plants, but several woody riparian species are present in association with this feature. In the offsite impact area, two small drainage features cross Wickerd Road, an existing narrow dirt road that accesses the site from the east. These two drainages have been impacted by road maintenance, invasive plants, and adjacent agricultural activities. The easternmost drainage includes limited riparian vegetation.

Land uses adjacent to the survey area include rural residential, active and fallow agricultural, large animal husbandry, unimproved roads, powerline easements, off-road vehicle activity,

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Figure 1

Project Vicinity Map

Golden Meadows, TT 31194
City of Menifee, California

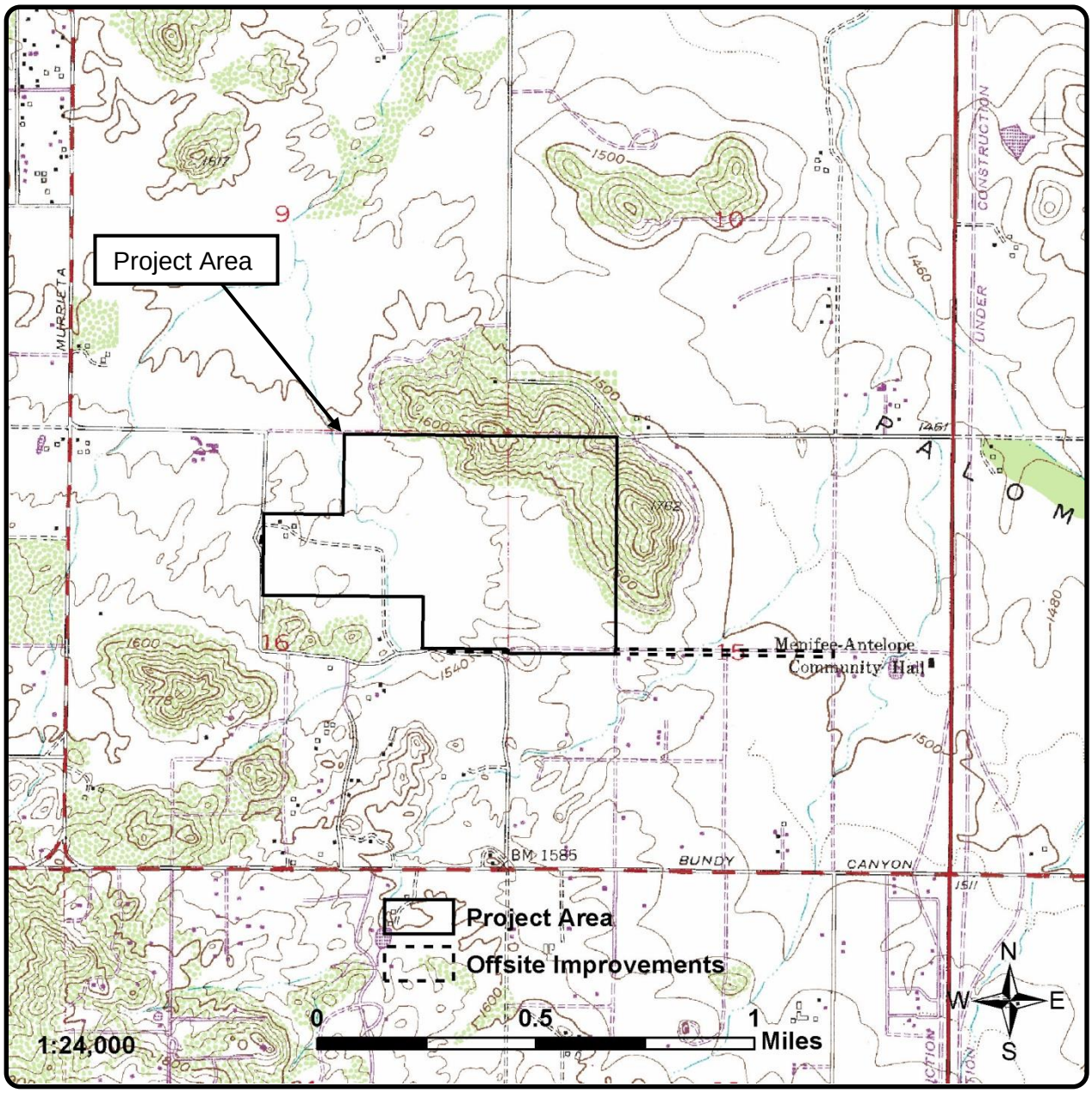

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Figure 2

Project Location Map
(USGS Romoland 1979 quadrangle,
Sections 15 & 16, Township 6 South, Range 3 West)

Golden Meadows, TT 31194
City of Menifee, California

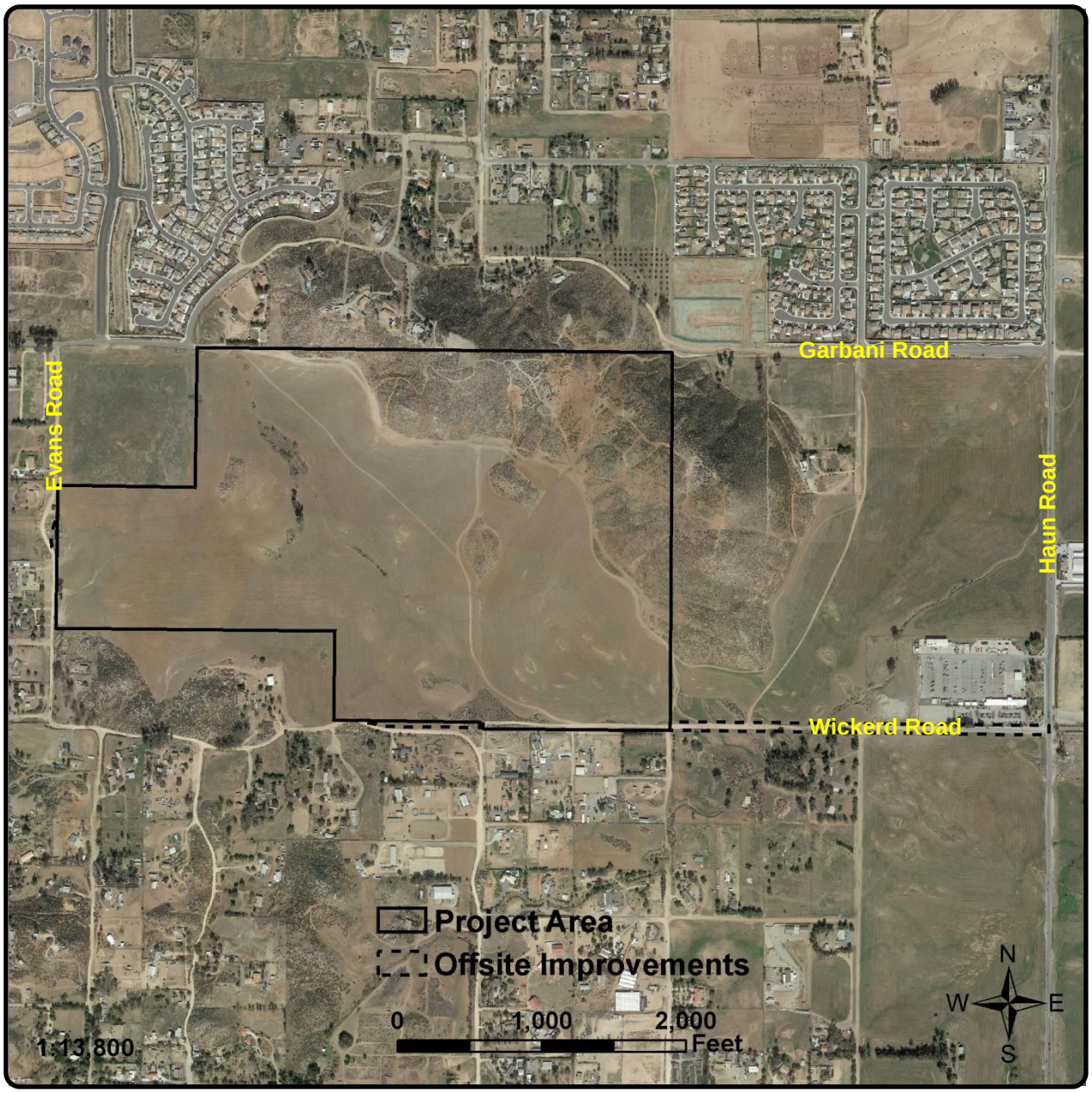

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Figure 3

Aerial Photograph
(Photo obtained from Google Earth, February 2018)

Golden Meadows, TT 31194
City of Menifee, California

storage, and debris piles. Two unimproved roads are present on the property. One is located along the northern and eastern portion of the property where agricultural areas meet less disturbed sage scrub areas. This unimproved road begins at the eastern terminus of Daniel Road and exits at the southeastern corner of the site near the intersection of Evans Road and Ascot Way. Krubsack Road (unimproved) trends north to south through previously cultivated agricultural fields within the roughly west-central portion of the property and connects with Wickerd Road to the south and Daniel Road to the north.

1.4) Soils and Topography

Soils on the Project site were mapped as Wyman loam (WyC2), Vallecitos loam (VeC2), Porterville clay (PsC), Yokohl loam (YbC and YbE3), Cajalco fine sandy loam (CaC2 and CaD2), Cajalco rocky fine sandy loam (CbF2), Honcut sandy loam (HnC and HnD2), Las Posas loam (LaD2), and Las Posas rocky loam (LkD2 and LkF3) (NRCS 2021) (Figure 4).

The most common soils mapped for the subject property are Wyman loam on the central and western portion of the site (in agricultural areas) and Las Posas rocky loams on vegetated hillsides within the northern and eastern portions of the site. Clay soils are relatively uncommon on the site, but Porterville clay is mapped as present near the southeastern portion of the property. Soils observed onsite range from mostly sandy-loamy within the agricultural areas to rocky loamy on the vegetated hillsides. Cryptobiotic crusts are present, but only within less disturbed portions of the site.

Topographically, much of the site is relatively flat and contains open land with low-relief rocky outcrops. Gently to steeply sloping hills and ridgelines are present within the northeastern portion of the property. The site has a combined maximum vertical relief of roughly 220 feet (67 meters) between the highest and lowest points on the property, with elevation ranging from approximately 1,500 to 1,720 feet (457 to 524 meters) above mean sea level (AMSL).

Surrounding topographic features in the project vicinity include gently to steeply sloping hills and ridgelines interspersed with lower-lying relatively flat areas. Although most surrounding areas of the Paloma Valley are primarily flat, significant topographic features are present northwest and southwest of the property at elevations of approximately 1,760 to 1,820 feet AMSL. Bell Mountain, a significant topographic feature located approximately two (2) miles east of the subject property, lies at 1,848 feet AMSL.

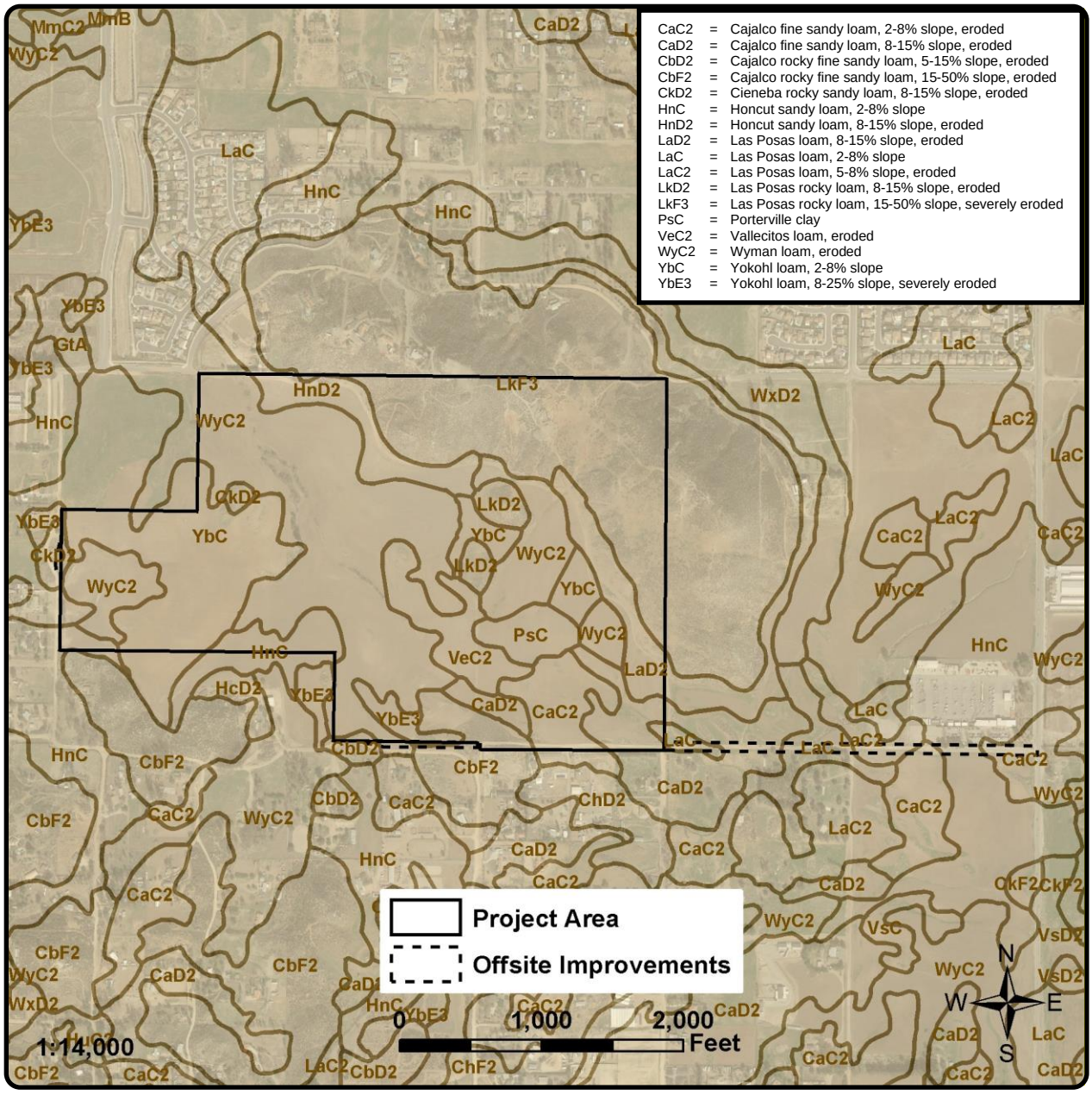

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Figure 4

Soils Map

(Photo obtained from Google Earth, February 2016, USDA Nat. Res. Cons. Serv. SSURGO Data)

Golden Meadows, TT 31194
City of Menifee, California

2.0) REGULATORY ENVIRONMENT

2.1) Jurisdictional Determination of Wetlands, “Waters of the U.S.”

The following section describes the regulatory environment prior to the U.S. Environmental Protection Agency (EPA) Proposed Rule (described in Section 2.1.3, below). Three agencies generally regulate activities within streams, wetlands, and riparian areas in California: (1) the U. S. Army Corps of Engineers (USACE) regulates activities under Section 404 of the federal Clean Water Act; (2) the Regional Water Quality Control Board (RWQCB) regulates activities under Section 401 of the federal Clean Water Act (CWA); and (3) the California Department of Fish and Wildlife (CDFW) regulates activities within under California Fish and Game Code Sections 1600-1616.

2.1.1) Federal Clean Water Act, Section 404

Section 404 of the federal Clean Water Act applies to "Waters of the United States" (WoUS). By definition these include waterways that could be used for interstate commerce and their tributaries, including any waters with a nexus with (ultimately flow into) traditional navigable waters. In non-tidal waters, the limits of jurisdiction are "ordinary high water marks" (OHWM) such as stream banks. Where wetlands occur above high water marks, they are considered "adjacent wetlands" and are included within USACE jurisdiction. USACE jurisdiction has often been extended to wetlands not adjacent to WoUS ("isolated wetlands"), such as vernal pools. Under the current administration, there have been recent changes to the definition of USACE jurisdictional waters.

According to the Clean Water Act (as amended in 1977) and the Corps of Engineers Wetlands Delineation Manual (1987), a "wetland" is a site that is "inundated or saturated . . . at a frequency and duration sufficient to support . . . vegetation typically adapted for life in saturated soil conditions. . . ." Soil saturation deprives plant roots of oxygen, limiting the types of plants that can grow. Absence of oxygen leads to reducing chemical conditions (rather than oxidizing conditions) and development of unique soil types (hydric soils). The USACE evaluates wetlands by three criteria: hydrology, soils, and vegetation. Under the federal delineation procedure, a site must normally satisfy all three criteria to be classified as a wetland.

The hydrology criterion evaluates the presence of water based on observed flooding or inundation or on indirect evidence such as high water marks, drift lines, or sediment deposits. The soils criterion is based on "hydric" soil characteristics, such as certain colors and mottling

that develop under wetland conditions. These characteristics generally do not develop in sandy soils found in many southern California streambeds. The vegetation criterion evaluates plant species growing on a site. Most plants cannot survive extended periods of root saturation and are called "obligate upland" species. Others grow almost exclusively in wetlands habitats, while still others may be found growing in both wetlands and uplands. These are called "obligate wetlands" or "facultative wetland" species, respectively.

2.1.2) Federal Clean Water Act, Section 401

The RWQCB has jurisdiction over wetlands, WoUS, and Waters of the State under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne) under the California Water Code (§ 13000, et. seq.) Permitting is required for activities that will result in a discharge of soils, nutrients, chemicals, detrital materials, or other pollutants into WoUS, Waters of the State, or adjacent wetlands that will affect the water quality of those bodies and the watershed.

2.1.3) Evaluation Criteria

According to the Clean Water Act (as amended in 1977) and the Army Corps of Engineers Wetlands Delineation Manual (1987), a "wetland" is a site that is "inundated or saturated . . . at a frequency and duration sufficient to support . . . vegetation typically adapted for life in saturated soil conditions. . . ." Soil saturation deprives plant roots of oxygen, limiting the types of plants that can grow. Absence of oxygen leads to reducing chemical conditions (rather than oxidizing conditions) and development of unique soil types (hydric soils). The USACE evaluates wetlands by three criteria: hydrology, soils, and vegetation. Under the federal delineation procedure, a site must normally satisfy all three criteria to be classified as a wetland. At its discretion, CDFW may regard a site as a wetland based on only one listed criterion.

The hydrology criterion evaluates the presence of water based on observed flooding or inundation or on indirect evidence such as high water marks, drift lines, or sediment deposits. The soils criterion is based on "hydric" soil characteristics, such as certain colors and mottling that develop under wetland conditions. (These characteristics generally do not develop in sandy soils found in many southern California streambeds.) The vegetation criterion evaluates plant species growing on a site. Most plants cannot survive extended periods of root saturation and are called "obligate upland" species. Others grow almost exclusively in wetlands habitats, while still others may be found growing in both wetlands and uplands. These are called "obligate wetlands" or "facultative wetlands" species, respectively. While the federal USACE

criteria are used to evaluate the presence or absence of wetlands within the project site, the determination of state wetland status is not based on the combined presence of the three criteria because the state can take jurisdiction of any one of the three: (1) the presence of water open or saturated soils, (2) presence of vegetation including riparian or wetland species, and/or (3) water-modified or oxygen-depleted soils.

Traditional Navigable Waters (TNWs) and Relatively Permanent Waters (RPWs), where water flows for three (3) or more months per year, are jurisdictional by definition; however, for Non-Relatively Permanent Waters (Non-RPWs) data and analysis supporting a "significant nexus" must be provided to justify USACE jurisdiction. Erosional features (i.e., small and large gullies), swales, and excavated roadside ditches are usually not considered jurisdictional.

According to the "U. S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook" (5/30/2007):

> Ephemeral waters in the arid west that are tributaries may have a significant nexus to a TNW. For example, in some cases they may serve as a critical transitional area between the upland environment and the traditional navigable waters. Such ephemeral tributaries, with the associated riparian corridor, may provide refugia, foraging and breeding opportunities in areas that may have limited stands of vegetation and water due to the environmental conditions of the arid southwest. During and following precipitation events, ephemeral tributaries collect and transport water or sometimes sediment from the upper reaches of the landscape to the traditional navigable waters. These ephemeral tributaries, and associated riparian corridors, may provide habitat for wildlife and aquatic organisms. These biological and physical processes may further support nutrient cycling, sediment retention and transport, pollutant trapping and filtration, and improvement of water quality, functions that may affect the integrity of a TNW.
>
> . . . Specifically, an evaluation will be made of the frequency, volume, and duration of flow; proximity to the TNW; capacity to transfer nutrients and organic carbon vital to support food webs; habitat services such as providing spawning areas for important aquatic species; functions related to the maintenance of water quality such as sediment trapping; and other relevant factors. In some cases, even tributaries that are relatively distant from a TNW may have a significant nexus with the TNW.

The following section describes the proposed changes to the Regulatory Environment which may occurred as a result of the EPA Proposed Rule. On December 11, 2018, the EPA and Department of the Army signed a proposed rule revising the definition of "waters of the United States" to clarify federal authority under the Clean Water Act. The agencies' proposal is the

second step in a two-step process to review and revise the definition of "waters of the United States" consistent with the February 2017 Presidential Executive Order entitled "Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the 'Waters of the United States' Rule." The proposed definition would replace the approach in the 2015 Rule and the pre-2015 regulations:

(a) For purposes of the Clean Water Act, 33 U.S.C. 1251 et seq. and it's implementing regulations, subject to the exclusions in paragraph (b) of this section, the term **"waters of the United States" means**:

(1) Waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including the territorial seas and waters which are subject to the ebb and flow of the tide;

(2) Tributaries of waters identified in paragraph (a)(1) of this section;

(3) Ditches that satisfy any of the conditions identified in paragraph (a)(1) of this section, ditches constructed in a tributary or that relocate or alter a tributary as long as those ditches also satisfy the conditions of the tributary definition, and ditches constructed in an adjacent wetland as long as those ditches also satisfy the conditions of the tributary definition;

(4) Lakes and ponds that satisfy any of the conditions identified in paragraph (a)(1) of this section, lakes and ponds that contribute perennial or intermittent flow to a water identified in paragraph (a)(1) of this section in a typical year either directly or indirectly through a water(s) identified in paragraphs (a)(2) through (6) of this section or through water features identified in paragraph (b) of this section so long as those water features convey perennial or intermittent flow downstream, and lakes and ponds that are flooded by a water identified in paragraphs (a)(1) through (5) of this section in a typical year; (5) Impoundments of waters identified in paragraphs (a)(1) through (4) and (6) of this section; and (6) Adjacent wetlands to waters identified in paragraphs (a)(1) through (5) of this section.

(b) **The following are not "waters of the United States":**

(1) Waters or water features that are not identified in paragraphs (a)(1) through (6) of this section;

(2) Groundwater, including groundwater drained through subsurface drainage systems;

(3) Ephemeral features and diffuse stormwater run-off, including directional sheet flow over upland;

(4) Ditches that are not identified in paragraph (a)(3) of this section;

(5) Prior converted cropland;

(6) Artificially irrigated areas, including fields flooded for rice or cranberry growing, that would revert to upland should application of irrigation water to that area cease;

(7) Artificial lakes and ponds constructed in upland (including water storage reservoirs, farm and stock watering ponds, and log cleaning ponds) which are not identified in paragraph (a)(4) or (a)(5) of this section;

(8) Water-filled depressions created in upland incidental to mining or construction activity, and pits excavated in upland for the purpose of obtaining fill, sand, or gravel;

(9) Stormwater control features excavated or constructed in upland to convey, treat, infiltrate or store stormwater run-off;

(10) Wastewater recycling structures constructed in upland, such as detention, retention and infiltration basins and ponds, and groundwater recharge basins; and

(11) Waste treatment systems.

(c) **Definitions**. In this section, the following definitions apply:

(1) **Adjacent wetlands**. The term adjacent wetlands means wetlands that abut or have a direct hydrologic surface connection to a water identified in paragraphs (a)(1) through (5) of this section in a typical year. Abut means to touch at least at one point or side of a water identified in paragraphs (a)(1) through (5) of this section. A direct hydrologic surface connection occurs as a result of inundation from a paragraph (a)(1) through (5) water to a wetland or via perennial or intermittent flow between a wetland and a

paragraph (a)(1) through (5) water. Wetlands physically separated from a paragraph (a)(1) through (5) water by upland or by dikes, barriers, or similar structures and also lacking a direct hydrologic surface connection to such waters are not adjacent.

(2) **Ditch**. The term ditch means an artificial channel used to convey water.

(3) **Ephemeral**. The term ephemeral means surface water flowing or pooling only in direct response to precipitation (e.g., rain or snow fall).

(4) **High tide line**. The term high tide line means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds, such as those accompanying a hurricane or other intense storm.

(5) **Intermittent**. The term intermittent means surface water flowing continuously during certain times of a typical year and more than in direct response to precipitation (e.g., seasonally when the groundwater table is elevated or when snowpack melts).

(6) **Ordinary high water mark**. The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

(7) **Perennial**. The term perennial means surface water flowing continuously year-round during a typical year.

(8) **Prior converted cropland**. The term prior converted cropland means any area that, prior to December 23, 1985, was drained or otherwise manipulated for the purpose, or having the effect, of making production of an agricultural product possible. EPA and the Corps will recognize designations of prior converted cropland made by the Secretary of Agriculture. An area is no longer considered prior converted cropland for purposes of

the Clean Water Act when the area is abandoned and has reverted to wetland, as defined in paragraph (c)(15) of this section. Abandonment occurs when prior converted cropland is not used for, or in support of, agricultural purposes at least once in the immediately preceding five years. For the purposes of the Clean Water Act, the EPA Administrator shall have the final authority to determine whether prior converted cropland has been abandoned.

(9) **Snowpack**. The term snowpack means layers of snow that accumulate over extended periods of time in certain geographic regions and high altitudes (e.g., in northern climes and mountainous regions).

(10) **Tidal waters** and waters subject to the ebb and flow of the tide. The terms tidal waters and waters subject to the ebb and flow of the tide mean those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters and waters subject to the ebb and flow of the tide end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

(11) **Tributary**. The term tributary means a river, stream, or similar naturally occurring surface water channel that contributes perennial or intermittent flow to a water identified in paragraph (a)(1) of this section in a typical year either directly or indirectly through a water(s) identified in paragraphs (a)(2) through (6) of this section or through water features identified in paragraph (b) of this section so long as those water features convey perennial or intermittent flow downstream. A tributary does not lose its status as a tributary if it flows through a culvert, dam, or other similar artificial break or through a debris pile, boulder field, or similar natural break so long as the artificial or natural break conveys perennial or intermittent flow to a tributary or other jurisdictional water at the downstream end of the break. The alteration or relocation of a tributary does not modify its status as a tributary as long as it continues to satisfy the elements of this definition.

(12) **Typical year**. The term typical year means within the normal range of precipitation over a rolling thirty-year period for a particular geographic area.

(13) **Upland**. The term upland means any land area that under normal circumstances does not satisfy all three wetland delineation criteria (i.e., hydrology, hydrophytic vegetation, hydric soils) identified in paragraph (c)(15) of this section, and does not lie below the ordinary high water mark or the high tide line of a water identified in paragraph (a)(1)

through (6) of this section. Waters identified in paragraphs (a)(1) through (6) of this section are not upland.

(14) **Waste treatment system**. The term waste treatment system includes all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater prior to discharge (or eliminating any such discharge).

(15) **Wetlands**. The term wetlands means areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

2.1.4) Federal Clean Water Act, Section 401

The RWQCB has jurisdiction over wetlands, WoUS, and Waters of the State under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne) under the California Water Code (§ 13000, et seq.) Permitting is required for activities that will result in a discharge of soils, nutrients, chemicals, detrital materials, or other pollutants into WoUS, Waters of the State, or adjacent wetlands that will affect the water quality of those bodies and the watershed.

At the time of the publication of this report no clear direction as to the new rule was available, consequently we have submitted this report assuming the presence of Federal Waters of the US. In the event that the EPA Proposed Rule goes into effect, L&L will revise this report to indicate no Federal Waters are present on the property.

2.1.5) California Fish and Game Code, Section 1600

The CDFW, through provisions of the California Fish and Game Code (Sections 1600-1616), is empowered to issue agreements (“Lake and Streambed Alteration Agreements”) for projects that will adversely affect wildlife habitat associated with any river, stream, or lake edges. The Lake and Streambed Alteration Agreement will typically include required measures to mitigate impacts.

Sections 1600-1616 of the California Fish and Game Code apply to stream channels, defined elsewhere in the Code as follows:

"A stream is a body of water that flows at least periodically through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

The state definition does not specify a flow rate or inundation frequency and provides no clear distinction between jurisdictional and non-jurisdictional lands.

While the federal USACE criteria (hydrology, soils, and vegetation) are used to evaluate the presence or absence of wetlands within the project site, the determination of state wetland status is not based on the combined presence of the three criterion because the state can take jurisdiction of any one of the three: (1) the presence of open water or saturated soils, (2) presence of vegetation including riparian or wetland species, and/or (3) water-modified or oxygen-depleted soils.

2.2) Western Riverside County Multiple Species Habitat Conservation Plan

The County of Riverside, including eight (8) additional land jurisdictions and 14 cities, have prepared a Multiple Species Habitat Conservation Plan (MSHCP) for western Riverside County (Dudek 2003a, 2003b). The MSHCP will build upon existing preserves and provide connectivity and wildlife corridors throughout the region. The MSHCP proposes to conserve approximately 500,000 acres and 146 different species.

The MSHCP was approved by the county on June 17, 2003 and an Implementation Agreement (IA) between the USFWS, the CDFW, and the County was executed and an associated USFWS Section 10(a)(1)(B) Permit (No. TE-088609) was issued on June 22, 2004. The permit grants take authorization for certain species identified in the permit as "Covered Species Adequately Conserved."

The MSHCP establishes seven (7) core reserve areas and associated linkages between proposed and existing core areas. The MSHCP divides areas into Cells using USGS coordinates. According to the Riverside County Integrated Project website parcels that compose the current project site are located within Sun City/Menifee Valley Area Plan. Conservation efforts for the project site will be evaluated with regard to sensitive species identified as not adequately conserved and observed onsite, riverine/riparian or vernal pool habitat and their associated sensitive species (if located onsite), fairy shrimp, jurisdictional areas, and sage scrub.

MSHCP Section 6.1.2 (Riparian/Riverine Habitat)

Section 6.1.2 of the MSHCP requires an assessment of the potentially significant effects of the proposed project on Riparian/riverine areas, and vernal pools as currently required by CEQA using available information augmented by project-specific mapping. Riparian/riverine areas and vernal pools are defined as follows:

- Riparian/riverine Areas are lands that have flow for all or a portion of the year and which contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year.

- Vernal pools are seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. The determination that an area exhibits vernal pool characteristics, and the definition of the watershed supporting vernal pool hydrology, must be made on a case-by case basis. Such determinations should consider the length of the time the area exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soils, and drainage characteristics, uses, to which it has been subjected, and weather and hydrologic records.

With the exception of wetlands created for the purpose of providing wetlands habitat or resulting from human actions to create open waters or from the alteration of natural stream courses, areas demonstrating characteristics as described above which are artificially created are not included in these definitions.

3.0) METHODS

3.1) Literature Review

Potential occurrence of state and federal wetlands and waters on the project site were evaluated through a literature review including the jurisdictional delineation conducted by L&L in 2011 (L&L 2012) and updated in 2018/2019 (L&L 2019) as well as reports of other previous surveys of the site, as needed (L&L 2003-2021). Literature reviewed also included soils maps and descriptions (Knecht 1971), topographic maps (USGS 1979), and the list of wetland plants in California (Appendix O to the Delineation Manual). Recent and historical aerial photographs of the project site and jurisdictional areas were reviewed and helped document the slow decline of the riparian habitat onsite. These images dated from 1938 through 2021 (Google Earth 2021, NETRonline 2021).

3.2) Jurisdictional Delineation Survey Methods

Soil maps and descriptions of local soils were reviewed (NRCS 2018). Soils mapped on the project site were listed and evaluated for their properties relating to potential wetlands. Soil conditions onsite were noted during field visits. Soil color characteristics were evaluated using a "Munsell color chart."

During field surveys, vegetation growing within features was examined. Dominant plant species were listed along with any potential indicators of wetland conditions. The U. S. Army Corps of Engineers (Corps), as part of an interagency effort with the U. S. Environmental Protection Agency (EPA), the U. S. Fish and Wildlife Service (FWS), and the U. S. Department of Agriculture Natural Resources Conservation Service (NRCS), has developed a National Wetland Plant List (NWPL). The NWPL is used to determine whether the hydrophytic vegetation parameter is met when conducting wetland determinations under the Clean Water Act and the Wetland Conservation Provisions of the Food Security Act. Other applications of the list include wetland restoration, establishment, and enhancement projects. The list was effective on May 1, 2016 and is used in any wetland delineation performed after this date. Delineations received prior to this date may still use the 2014 NWPL or may choose to use the 2016 list. The reference list used must be identified on any wetland delineation/determination forms. The vegetation criterion for wetlands is satisfied if half or more of the dominant plant species in an area are ranked as "obligate wetland," "facultative wetland," or "facultative" species (OBL, FACW, or FAC, respectively, see Table 1).

A recent biological assessment (L&L 2021) field reconnaissance, May and June 2021, addressed vegetation and other biological resources on the project site, which aided in the mapping of reduced arroyo willow/mulefat wetland habitats. This field reconnaissance supported by a desktop analysis of recent aerial images (Google Earth 2021) was used to map current conditions and identify changes from the 2011 and 2018/2019 jurisdictional delineations.

Table 1. Summary of Wetlands Vegetation Criteria

Category	Probability
Obligate Wetland (OBL)	Almost always occur in wetlands (estimated probability >99%)
Facultative Wetland (FACW)	Usually occur in wetlands (Estimated probability 67%-99%)
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands (est. probability 34%-66%)
Facultative Upland (FACU)	Usually occur in non-wetlands (estimated probability 67%-99%)
Obligate Upland (UPL)	Almost always occur in non-wetlands (estimated probability >99%)

3.3) MSHCP Riparian/Riverine and Vernal Pools

In conformance with the MSHCP, this report addresses riparian/riverine areas and vernal pools within the feature descriptions of each system. Where riparian vegetation is associated with features (and to the extent that it is native to California), we considered it suitable for a designation as riparian under the MSHCP. Where flows evidence some level of energy, at least ephemerally, we considered them riverine in the broadest sense.

To meet the definition of a vernal pool, three (3) factors must be addressed: suitable soils and soils conditions, proper hydrology, and one or more indicator species.

4.0) RESULTS

4.1) Literature Review Results

The 2011 jurisdictional delineation conducted by L&L found that the jurisdictional areas identified on the project site were calculated as 6,080 sq. ft. (0.140 acre) of CDFW unvegetated state streambed and 50,634 sq. ft. (1.162 acre) of CDFW state wetland. The survey also identified 2,631 sq. ft. (0.060 acre) of USACE WoUS, none of which is USACE federal wetland.

The 2018 update to the jurisdictional delineation incorporated two culverts along Wickerd Road, resulting in increased offsite impacts to state and federal jurisdictional features. Jurisdictional areas identified within the property include 6,657 sq. ft. (0.153 acre) of CDFW unvegetated state waters/streambed (which is also MSHCP Riverine habitat) and 52,627 sq. ft. (1.208 acres) of CDFW state wetland (which is also MSHCP Riparian habitat). The survey also identified 2,828 sq. ft. (0.065 acre) of USACE WoUS, none of which is USACE federal wetland.

A review of recent and historic aerials shows that the project site has been under cultivation since at least 1938 (Google Earth 2021, NETRonline 2021). The drainage is visible in 1938 but appears to include little shrubby vegetation. On the aerials taken in 1967 and 1978, the drainage does not appear to include any shrubby vegetation. By 1996, the drainage appears to have patches of vegetation, assumed to be native riparian shrubs and trees, along some portions of its length on the project site. In aerials dated from 2002 through 2021, the vegetation in the drainage becomes visibly less dense and shrinks in most places to individual or very small bunches of trees and bushes. This corresponds to observations during surveys by L&L from 2003 through 2021, which indicate that riparian vegetation has declined considerably in recent years and portions of the riparian area have been incorporated into the croplands.

4.2) Vegetation Communities

Much of the subject property has been disturbed by historic and current cultivation and sheep grazing and does not support native habitat. Less disturbed areas are present, primarily in the northeastern portions of the site, with a mixture of disturbed and relatively undisturbed California buckwheat scrub and chamise chaparral. Sparse riparian vegetation and trees are found along a portion of the USGS mapped blue-line stream area in the northwestern/central portion of the site (Figure 5). A list of all plants and wildlife observed on the site is provided in Appendix C.

4.2.1) California Buckwheat Scrub

Relatively undisturbed California buckwheat scrub (previously Holland Riversidean sage scrub) is present on the eastern and northern (primarily northeastern) portion of the site on south, west, and east-facing slopes containing numerous rocky outcrops. Native shrubs and other conspicuous plants commonly observed in these areas include California buckwheat (*Eriogonum fasciculatum*), California sagebrush (*Artemisia californica*), and white sage (*Salvia apiana*). Other conspicuous plants include brittlebush (*Encelia farinosa*), yellow bush penstemon (*Keckiella antirrhinoides*), wishbone bush (*Mirabilis laevis* var. *crassifolia*), sweetbush (*Bebbia juncea*), blue elderberry (*Sambucus nigra* ssp. *cerulea*), and black sage (*Salvia mellifera*). Open patches can be found throughout portions of the buckwheat scrub onsite containing a mixture of native and non-native annuals.

4.2.2) Chamise Chaparral

Small patches (or islands) of remnant chamise chaparral (*Adenostema fasciculatum* Shrubland Alliance) or chamise–black sage chaparral (*Adenostema fasciculatum–Salvia mellifera* Shrubland Alliance) (previously Holland northern mixed chaparral) were observed, excluding the east-central property boundary where some relatively dense stands remain and mix with California buckwheat scrub (especially just offsite to the east). Common species found in the chaparral areas onsite are chamise (*Adenostoma fasciculatum*), black sage, and other perennials. A poorly developed understory is usually present in association with chaparral areas and is characteristic of areas observed on the subject site and in adjacent areas.

4.2.3) Arroyo Willow Thickets and Mulefat Thickets

Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance) and mulefat thickets (*Baccharis salicifolia* Shrubland Alliance) (previously Holland southern arroyo willow riparian and mulefat scrub) are dependent on the presence of at least periodic surface or subsurface water. The northwestern portion of the site contains a degraded USGS mapped blue-line stream sparsely inhabited by arroyo willow (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), or a combination of these species. A single Fremont cottonwood tree (*Populus fremontii* ssp. *fremontii*) and scattered non-native tamarisks (*Tamarix* species) were also observed. The understory is dominated by mostly weedy annuals, including (but not limited to) short-pod mustard, annual sunflower, fiddleneck, Spanish clover (*Acmispon americanus*), wild radish (*Raphanus sativus*), mayweed (*Anthemis cotula*), prickly lettuce (*Lactuca serriola*), and several non-native grasses, including common wheat (*Triticum aestivum*) and oat (*Avena* species).

Surface water was not observed within any of the onsite drainage features during biological surveys in 2013 or 2017 and none was observed during the jurisdictional delineation in 2011 and field reconnaissance in 2018 or 2021. These areas appeared to be considerably less densely populated with riparian shrubs and trees in 2021, when compared to previous surveys. This may be due to the prolonged drought that affected this area in recent years (approximately 2010 to 2016).

4.2.4) Agriculture and Disturbed/Ruderal

Agriculture is not included under the more recent Sawyer et al. (2009) classification utilized by CDFW. Disturbed/ruderal areas that are strongly dominated by annual non-natives may be classified as semi-natural stands, such as *Brassica* (*nigra*) and Other Mustards Semi-natural Herbaceous Stands or *Bromus rubens—Schismus* (*arabicus*, *barbatus*) Semi-natural Herbaceous Stands.

The majority of the site has been under consistent cultivation, mainly dry-farmed wheat crops. Invasive plants were observed uncommonly within flatland portions of the site, including lamb's quarters (*Chenopodium murale*), calabazilla (*Cucurbita foetidissima*), and knotweed (*Polygonum aviculare*).

Disturbed habitat includes unvegetated areas (such as roads) and areas that contain mostly non-native plant species, including ornamentals and ruderal invasive species. Some non-native and weedy species have invaded these areas, including short-pod mustard, foxtail chess, red-stemmed filaree (*Erodium cicutarium*), and various non-native grasses. Other non-native plant species observed in these areas include horehound (*Marrubium vulgare*), Russian thistle (*Salsola tragus*), and tumbling pigweed (*Amaranthus albus*).

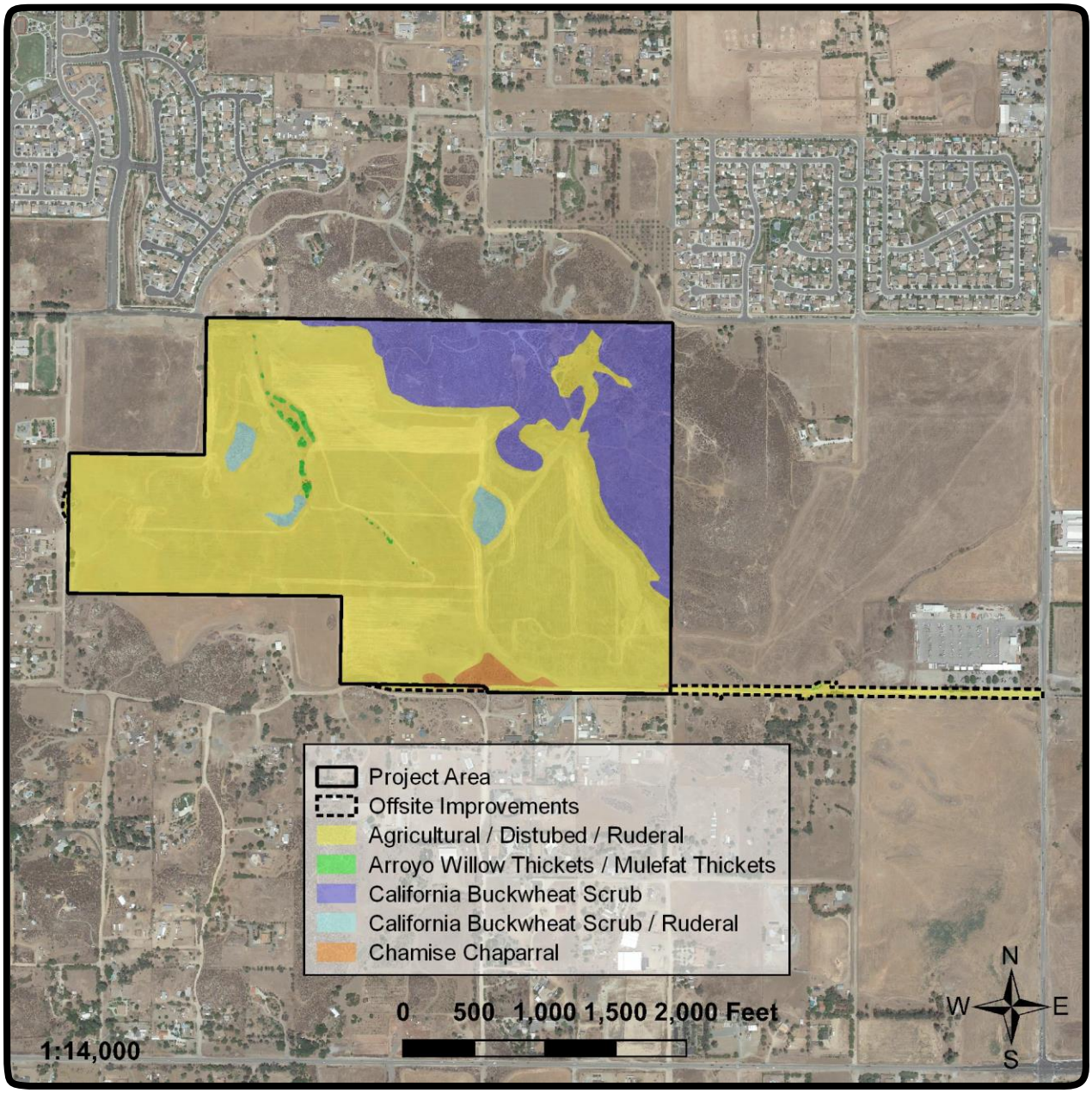

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Figure 5

Vegetation Community Map
(Photo obtained from Google Earth, August 2021)

Golden Meadows, TT 31194
City of Menifee, California

4.3) State and Federal Jurisdictional Areas

The nearest Traditionally Navigable Water (TNW) is Canyon Lake (the nearest point of which is approximately 3 miles straight northwest of the project area). Canyon Lake connects to Lake Elsinore and on to the Pacific Ocean (Figure 6). However, between the Paloma Valley High School Channel and Canyon Lake there is a flood plain, so very high precipitation would be required for any surface water to reach Canyon Lake. All features onsite match Cowardin Code R6 (Riverine, Ephemeral).

Land use and cultivation patterns changed slightly over the years of L&L studies on the property beginning in 2003, during which annual rainfall levels have fluctuated. During each of the calendar years between 2003, 2006, 2011, 2017, 2018 and 2019 when L&L studied or otherwise visited the property, wheat crop propagation was occurring on the cleared portions of land surrounding the riparian vegetation. Dry areas and gaps in the vegetation appear to have been incorporated into the wheat crop production. Downstream, the development of the adjacent tract has created a large paseo and this is "misaligned" with the historic blue-line, resulting in some shifting of the waters/riparian vegetation in our study area.

Jurisdictional areas identified within the property include 18,814 sq. ft. (0. 43 acre) of CDFW unvegetated state waters/streambed (which is also MSHCP Riverine habitat) and 40,451 sq. ft. (0.93 acres) of CDFW state wetland (which is also MSHCP Riparian habitat). The survey also identified 4,397 sq. ft. (0. 10 acre) of USACE WoUS, none of which is USACE federal wetland.

Feature 1

Feature 1 (F1) runs from the center portion of the property to the northwestern boundary. This feature measures 1,128 linear feet (lf) and runs from south to north. Feature 1 is comprised of 6,842 sq. ft. of CDFW state streambed (MSHCP Riverine habitat), 15,916 sq. ft. of CDFW wetland (MSHCP Riparian habitat) and 1290 sq. ft. (430 lf) of WoUS.

Feature 1b

Feature 1b (F1b) is an isolated feature that measures 358 lf. and runs from southeast to northwest within the center of the site. It is comprised of 1,797 sq. ft. of CDFW state streambed (MSHCP Riverine habitat), 2,751 sq. ft. of CDFW wetland (MSHCP Riparian habitat) and 716 sq. ft. (358 lf) of WoUS. Observations in the field, verified by agency personnel, have determined that the feature is isolated and there is no evidence of surface connection.

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Figure 6

Connection to Pacific Ocean
(Photo obtained from Google Earth, 6-7-2012)

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Feature 2

Feature 2 (F2) measures 1042 lf and runs from south to north within the northwestern portion of the site parallel to Feature 1. Feature 2 is comprised of 8,275 sq. ft. of CDFW state streambed (MSHCP Riverine habitat), 20,913 sq. ft. of CDFW wetland (MSHCP Riparian habitat) and 1806 sq. ft. (602 lf) of WoUS.

Feature 3

This "feature" shows no evidence of beds or banks. No jurisdictional streambed is present.

Feature 4

This offsite feature is the easternmost of the two small drainages that cross Wickerd Road. It measures 188 lf; 1,289 sq. ft. of CDFW state streambed (MSHCP Riverine habitat), 871 sq. ft. of CDFW wetland (MSHCP Riparian habitat) and 325 sq. ft. of WoUS (130 lf).

Feature 5

This offsite feature is the westernmost of the two small drainages that cross Wickerd Road. It measures 130 lf; 611 sq. ft. of CDFW state streambed (MSHCP Riverine habitat), with no CDFW wetland or MSHCP Riparian habitat present and 260 sq. ft. WoUS (130 lf).

Cubic yards (cy) of fill is calculated for WoUS as follows: Feature 1 - 0 cy, Feature 1b - 239 cy, Feature 2 - 0 cy, Feature 3 - 0 cy, Feature 4 – 45 cy, and Feature 5 - 5 cy, for a total proposed fill in WoUS of 289 cy of fill.

Unconnected Features

Several other unconnected features were identified from aerial photos and were analyzed in the field (Figure 7). All of these features appear to be erosional and related to an unimproved road system. The area surrounding these features is highly disturbed and, at the time of our fieldwork, showed no connection to other features. Further, they neither received nor transported flows off property. As a result, we did not include them in further discussions.

Post-project BMPs

Post-construction BMPs include minimizing urban runoff, minimizing impervious footprint, conserving natural areas, and minimizing Directly Connected Impervious Areas (DCIAs). BMPs

have been provided in order to address water quality in low flows and first flush storm runoff, as well as to control post-construction peak flow volumes.

A combination of detention basins and infiltration basins will be constructed on site as post-construction Best Management Practices. The design of these facilities is in accordance with published standards from the Riverside County Flood Control and Water Conservation District. The project proponent will construct the facility according to local standards, requirements, and specifications, and will maintain the facility until the Homeowner's Association is established. Upon formation of the HOA, they will assume maintenance responsibilities, which will be funded through monthly homeowner assessments.

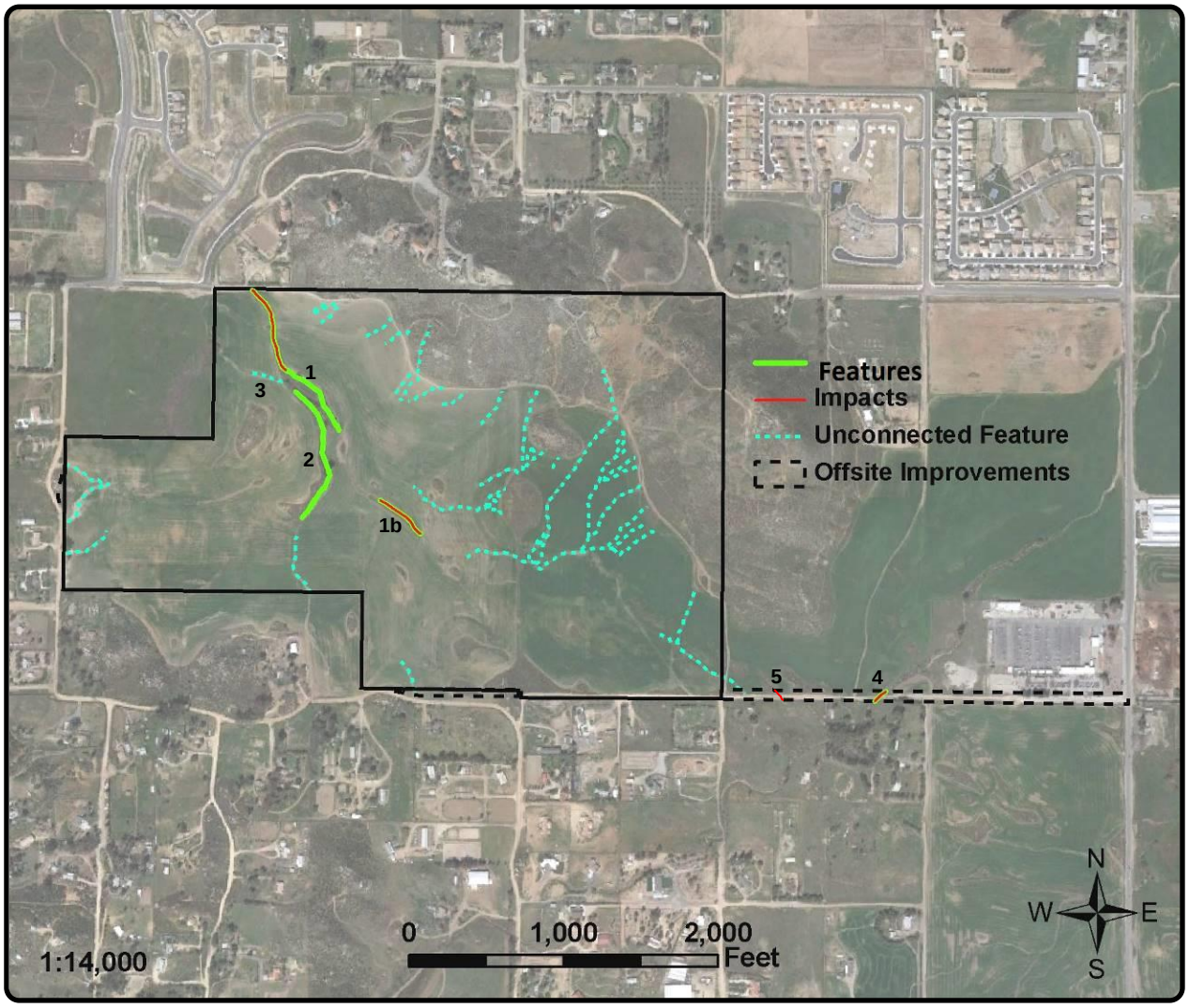

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Figure 7

Jurisdictional Delineation
(Photo obtained from Google Earth, 3-9-2011)

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4.4) MSHCP Riparian/Riverine and Vernal Pool Habitat

Under MSHCP Volume 1 Section 6.1.2, areas associated with wetland and streambed systems must be evaluated for consideration as riparian/riverine or vernal pool habitat. Riparian/riverine areas are defined within the MSHCP as:

> ". . . lands which contain Habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year." MSHCP Vol. 1, Section 6.1.2.

The subject site contains woody water dependent vegetation. Arroyo willow (*Salix lasiolepis*), cottonwood (*Populus fremontii*), and mulefat (*Baccharis salicifolia*) are present within the mapped features (Figure 5). Fresh water flows through the ephemeral stream that is present and mapped as a USGS blueline.

Vernal pools are defined within the MSHCP as:

> ". . . seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. . . ." MSHCP Vol. 1, Section 6.1.2.

Soil types within the study area are not consistent with an alkali playa or vernal pool complex and pools or depressions characteristic of vernal habitat were not noted as present on the subject property. No MSHCP species listed for protection associated with riparian/riverine areas and vernal pools were observed. No fairy shrimp or fairy shrimp habitat was observed during this study.

The updated jurisdictional delineation found 18,814 sq. ft. (0.43 acre) of Western Riverside County MSHCP Riverine habitat and 40,451 sq. ft. (0.93 acres) of MSHCP Riparian habitat.

5.0) AVOIDANCE MINIMIZATION AND MITIGATION STRATEGY

5.1) Evaluated Alternatives

Five (5) alternatives were examined during development planning regarding impacts to jurisdictional areas:

1. **Proposed Action** entails use of the entire area of all owned parcels for a housing development and the impact of all features. Since the entire site would be utilized, the only post-project flow of water onsite would be associated with storm water runoff and water quality basins necessary to reduce flooding and for some nutrient and waste processing. All mitigation for impacts would occur offsite. This alternative was judged to be infeasible because it failed to achieve the requirement to minimize and avoid impacts to jurisdictional areas.

2. **Reduced Federal Action** includes avoidance of most jurisdictional features (particularly the higher quality portions) and onsite reconstruction and restoration of a significant area surrounding avoided jurisdictional area. This alternative would impact 2,657 sq. ft. (0.061 acre) of CDFW state streambed and 10,983 sq. ft. (0.252 acre) of CDFW state wetland. A total of 1,521 sq. ft. (0.035 acre) of federal WoUS would be impacted. The project proposes to avoid 41,644 sq. ft. (0.956 acre) of riparian habitat and 4,000 sq. ft. (0.092 acre) of unvegetated drainages. Onsite mitigation includes a total area of 156,380 sq. ft. (3.59 acre and 416 lf), of which 0.96 acre of state wetland is avoided and preserved, 0.092 acre of state streambed and 0.03 acre of WoUS is avoided and restored, and an additional 2.63 acres of state streambed/WoUS is restored by the removal of debris, exotic tamarisk, and weeds. This alternative is feasible because it minimizes impacts and avoids, enhances, and restores jurisdictional areas and riparian/riverine habitat that have been damaged by dryland farming in the area. However, preserved and restored habitat would be surrounded by residential development and habitat value would subsequently be much lower than habitat that is part of a larger contiguous block of open space.

3. **No Jurisdictional Impacts Alternative** would require avoidance of all jurisdictional areas within the owned parcels. Dryland farming and/or grazing activities would continue to occur, no conservation of the remaining riparian vegetation would occur, and no reconstruction or restoration activities would occur. This option is considered impractical because it would not allow for infrastructure and circulation elements

required to support housing in the area and the reduction of allowed units makes this project alternative infeasible.

4. **Offsite Alternative** would involve purchasing an equivalent sized property with no jurisdictional areas present. This alternative was judged to be impractical when the cost of engineering, land planning, and the value of the current land was considered.

5. **Compatible Use Alternative** would incorporate the existing onsite drainages into the compatible use areas. This alternative would impact 9,541 sq. ft. (0.22 acre) of CDFW streambed and 5,702 sq. ft. (0.13 acre) of CDFW state wetland. A total of 1,301 sq. ft. (0.03 acre) of federal WoUS would be impacted. Further, the project proposes to incorporate the remaining jurisdictional areas on the site into the Compatible Use Area: 9,273 sq. ft. (0.21 acre) of state streambed and 34,749 sq. ft. (0.80 acre) of state wetland, including 3,096 sq. ft. (0.07 acre) of WoUS. Offsite mitigation at no net loss to functions and values would be accomplished through purchase of credits at an approved mitigation bank. This is feasible because it compensates for impacted jurisdictional areas through offsite preservation of habitat that is part of a larger contiguous area of habitat. Habitat value would consequently be substantially higher than onsite habitat surrounded by development (i.e., Alternative 2). This alternative was discussed and agreed to at a meeting between Richland, L&L, USFWS, CDFW, RWQCB, USACE, and the Western Riverside County Regional Conservation Authority on April 11, 2018.

5.2) Least Environmentally Damaging Practical Alternative

L&L evaluated all five alternatives and found that Alternative 5, the Compatible Use Alternative, meets the project goal of providing residential housing in the Menifee area and compensates for impacts to jurisdictional areas and riparian/riverine habitat by providing increased habitat value.

Compatible Use

Compatible use areas allow for the continued use of the land as has been occurring but in general allow for non-destructive uses.

6.0) CONCLUSIONS

The purpose of this study was to verify and update the results of a 2011 jurisdictional delineation that identified jurisdictional waters/wetlands and MSHCP Riparian/Riverine areas present onsite and to determine which areas of the property would be impacted by planned development.

The jurisdictional areas identified on the project site were updated as 18,814 sq. ft. (0.43 acre) of CDFW unvegetated state streambed and 40,451 sq. ft. (0.93 acres) of CDFW state wetland. The survey also identified 4,397 sq. ft. (0.10 acre) of USACE WoUS, none of which is USACE federal wetland. A total of 59,265 sq. ft. (1.361 acres) of Western Riverside County MSHCP Riparian/Riverine habitat was identified within the proposed project area (see Figure 7 and Table 2 in Appendix A).

The current development plan indicates impacts to 9,541 sq. ft. (0.22 acre) of CDFW state streambed, 5,702 sq. ft. (0.13 acre) of CDFW state wetland, and 1,301 sq. ft. (0.03 acre) of USACE WoUS. Further, the project proposes to retain 9,273 sq. ft. (0.21 acre) of state streambed and 34,749 sq. ft. (0.80 acre) of state wetland, including 3,096 sq. ft. (0.07 acre) of WoUS, by incorporating these areas onsite within a Compatible Use Area.

Regulatory agency permits/agreements and an MSHCP Determination of Biologically Equivalent or Superior Preservation (DBESP) will be required before project-related impacts occur.

This document has been prepared to assist in planning and to accompany permit applications or agreements under federal or state law.

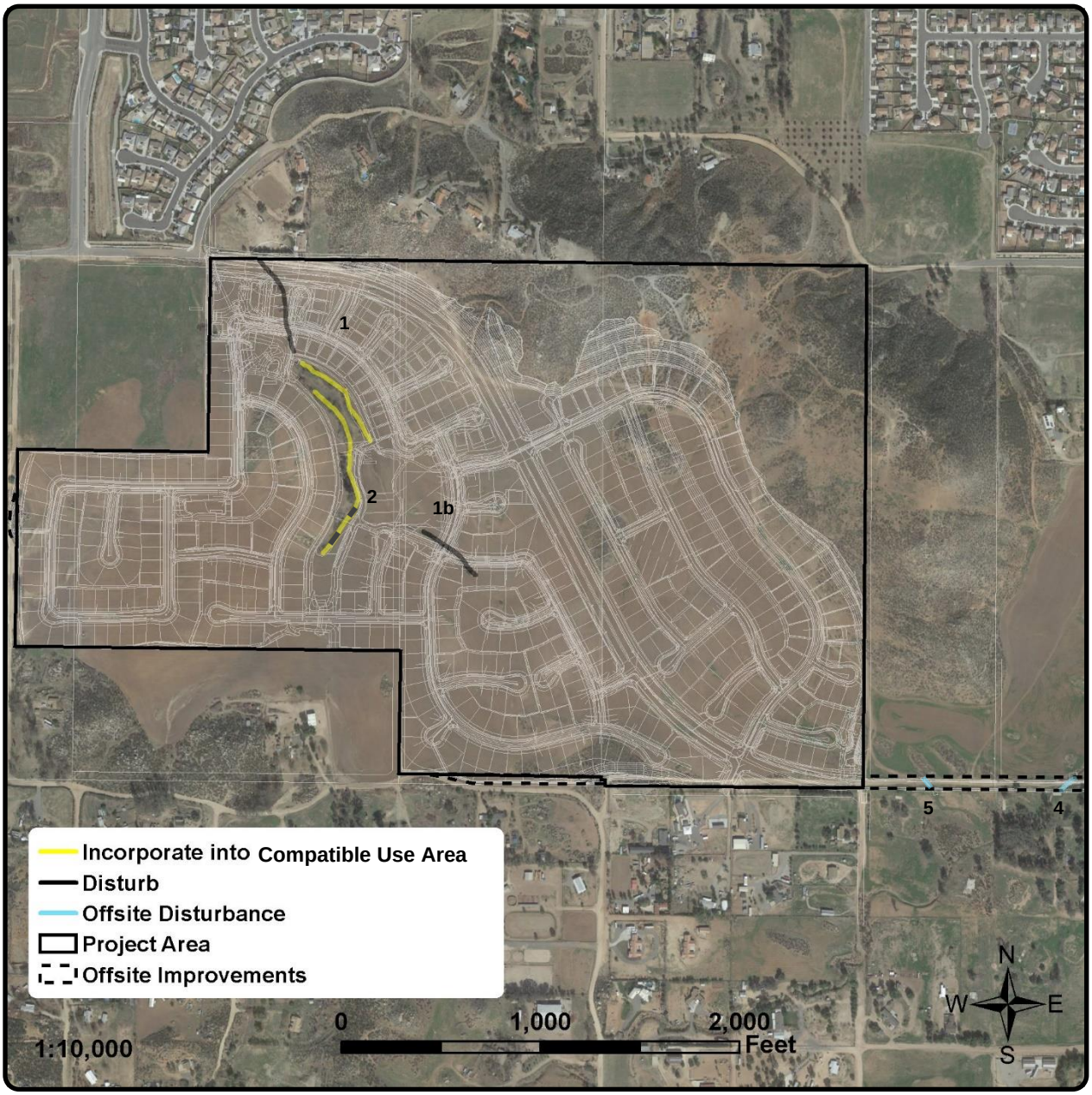

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Figure 8

Water Resources with Dev.
(Plan obtained from Hunsaker & Assoc. Irvine, Inc., 2021)

Menifee Assemblage, TT 31194
City of Menifee, California

7.0) REFERENCES

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APPENDIX A

Table 2. Summary of wetlands criteria and jurisdiction.

Feature	Lat/Long (UTM)	Cowardin Code	HGM Code	Length (ft.)	State Streambed Area (sq. ft.) / Avg. Width (ft.)	Federal Feature Area (sq. ft.) / Avg. Width (ft.)	Hydro	Veg	Soils	State Wetland (sq. ft.) / Avg. Width (ft.)	Federal Wetland (sq. ft.) / Avg. Width (ft.)	MSHCP Riverine (sq. ft.) / Avg. Width (ft.)	MSHCP Riparian (sq. ft.) / Avg. Width (ft.)
1	33.652423 -117.19284	R6	Riverine	1,128	6,842 / 11.9	1,290 / 3	X	X		15,916 / 28.73	-----	6,842 / 11.9	15,916 / 28.73
1b	33.654232 -117.19348	R6	Riverine	358	1,797 / 9.6	716 / 2	X	X		2,751/ 16.2	-----	1,797 / 9.6	2,751/ 16.2
2	33.65357 -117.19258	R6	Riverine	1,042	8,275 / 16.6	1,806 / 3	X	X		20,913 / 38.4	-----	8,275 / 16.	20,913 / 38.4
3	33.651763 -117.1909	N/A	N/A	----	-----	-----				-----	-----	-----	-----
4	33.648827 -117.18092	R6	Riverine	188	1,289 / 12.5	325 / 2.5	X	X		871 / 10.25	-----	1,289 / 12.5	871 / 10.25
5	33.648654 -117.18552	R6	Riverine	130	611 / 4.7	260 / 2	X			----	----	611 / 4.7	----
TOTAL				**2,846**	**18,814 (0.43 acre)**	**4,397 (0.10 acre)**				**40,451 (0.93 acres)**	-----	**18,814 (0.43 acre)**	**40,451 (0.93 acres)**

Table 3. Summary of impacts.

Feature	Total Impacted [sq. ft (acres)]			
	State Streambed / MSHCP Riverine	State Wetland / MSHCP Riparian	Federal Waters	Federal Wetland
1	5498	1824	0	0
1b	1797	2751	716	0
2	346	256	0	0
3	0	0	0	0
4 (offsite)	1289	871	325	0
5 (offsite)	611	0	260	0
TOTALS*	**9,541 (0.219 ac)**	**5,702 (0.131 ac)**	**1,301 (0.03 ac)**	**0**

Table 4. Areas to be incorporated into Compatible Use Area.

Feature	Total Incorporated into the Avoidance/Compatible Use Area [sq. ft (acres)]			
	State Streambed / MSHCP Riverine	State Wetland / MSHCP Riparian	Federal Waters	Federal Wetland
1	1344	14,092	1290	0
1b	0	0	0	0
2	7929	20,657	1806	0
3	0	0	0	0
4 (offsite)	0	0	0	0
5 (offsite)	0	0	0	0
TOTALS*	**9,273 (0.21 ac)**	**34,749 (0.80 ac)**	**3,096 (0.07 ac)**	**0**

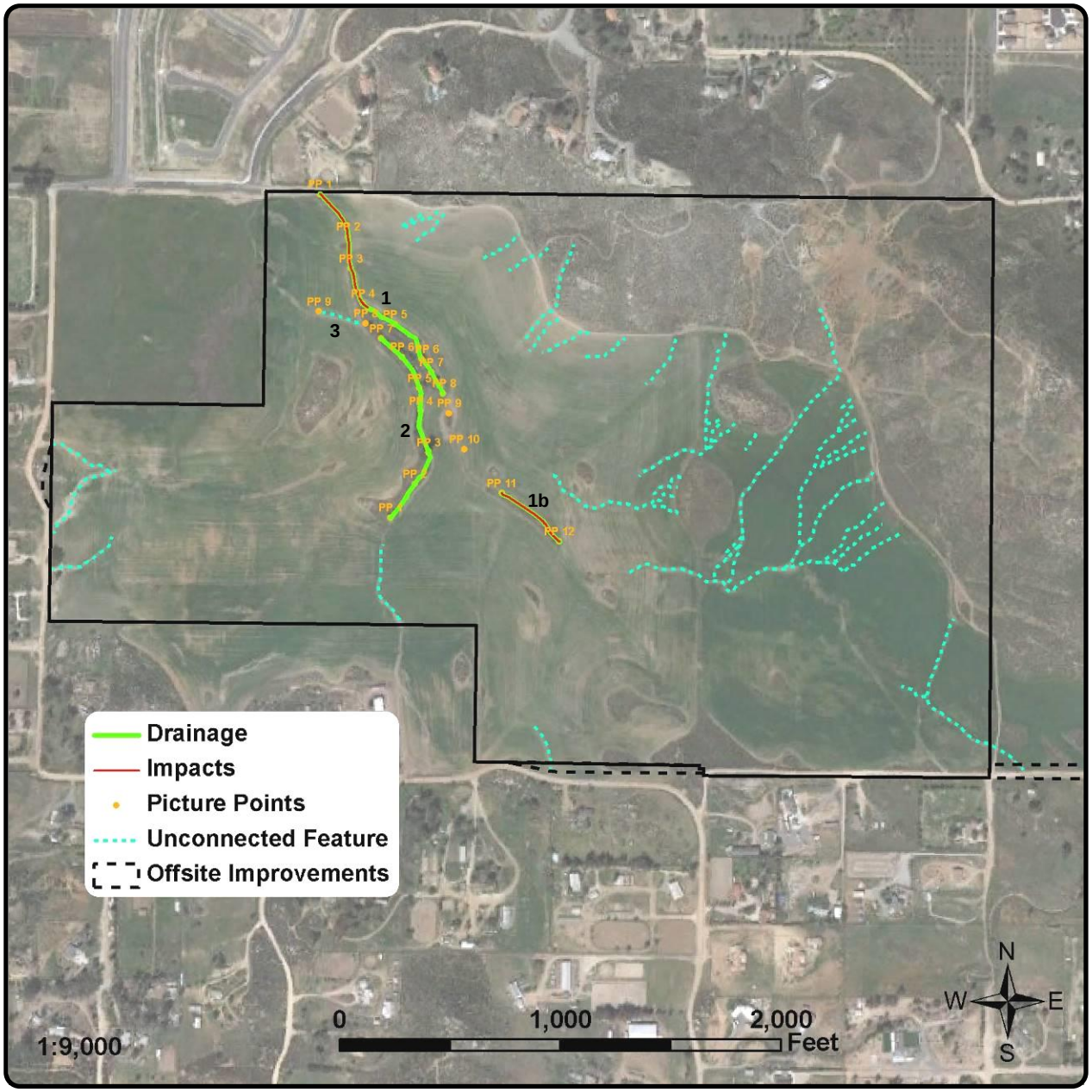

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Figure 9

Photograph Locations
(Photo obtained from Google Earth, 3-9-2011)

Golden Meadows, TT 31194
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Table 5. Photographs of features (December 14, 2011).

Data Point / GPS Location (WGS 84)	North	West	South	East	Comments
Feature 1 - PP 1 33.655946° -117.194387°					
PP 2 33.655420° -117.193964°					
PP 3 33.655025° -117.193915°					North – patch of mulefat present
PP 4 33.654590° -117.193731°					South - tamarisk

Data Point / GPS Location (WGS 84)	North	West	South	East	Comments
PP 5 33.654335° -117.193251°					South – willows begin
PP 6 33.653907° -117.192852°					
PP 7 33.653740° -117.192704°					North – mulefat and willows mix South – mulefat and willows mix
PP 8 33.653480° -117.192530°					

Data Point / GPS Location (WGS 84)	North	West	South	East	Comments
PP 9 33.653230° -117.192437°					East - mulefat
Feature 1b – PP 11 33.652246° -117.191637°					South – group of willows
PP 12 33.651649° -117.190779°					

Data Point / GPS Location (WGS 84)	North	West	South	East	Comments
Feature 2 - PP 1 33.651927° -117.193294°					North - willows
PP 2 33.652347° -117.192941°					
PP 3 33.652741° -117.192733°					North – some eucalyptus South - mulefat
PP 4 33.653259° -117.192854°					North – willow and cottonwood

Data Point / GPS Location (WGS 84)	North	West	South	East	Comments
PP 5 33.653540° -117.192882°					
PP 6 33.653926° -117.193140°					
PP 7 33.654155° -117.193459°					

Data Point / GPS Location (WGS 84)	North	West	South	East	Comments
Feature 3 - PP 8 33.654344° -117.193689°					
PP 9 33.654484° -117.194388°					West – all signs of feature end

APPENDIX B

Site Photographs

(0004) Wheat field 03.28.2017

(0025) Wheat field 03.28.2017

(3902) Trees along riparian area (background) within the open field 05.14.2019

(3892) Trees along riparian area within the open field 05.14.2019

(895) Trees in riparian area (from L&L 2013)

Potential raptor nest in eucalyptus tree within riparian area (from L&L 2013)

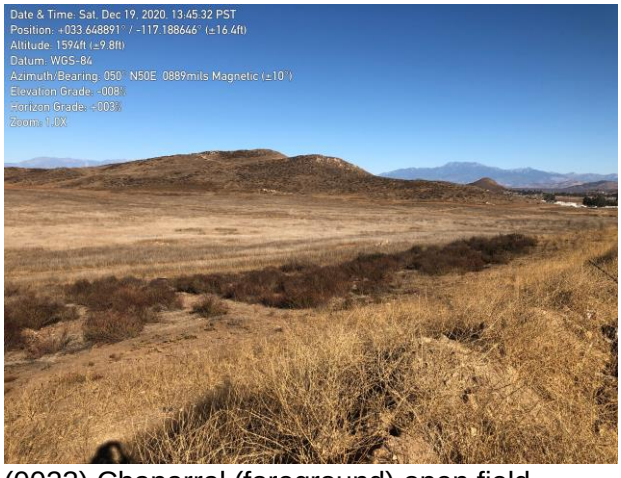
(0033) California buckwheat scrub 03.28.17

(0042) California buckwheat scrub with wheat field to the right 03.28.2017

(0056) "Island" of California buckwheat scrub within wheat field 03.28.2017

(0058) "Island" of California buckwheat scrub (foreground) within wheat field, hills with buckwheat scrub in background

(0022) Chaparral (foreground) open field beyond 12.19.2020



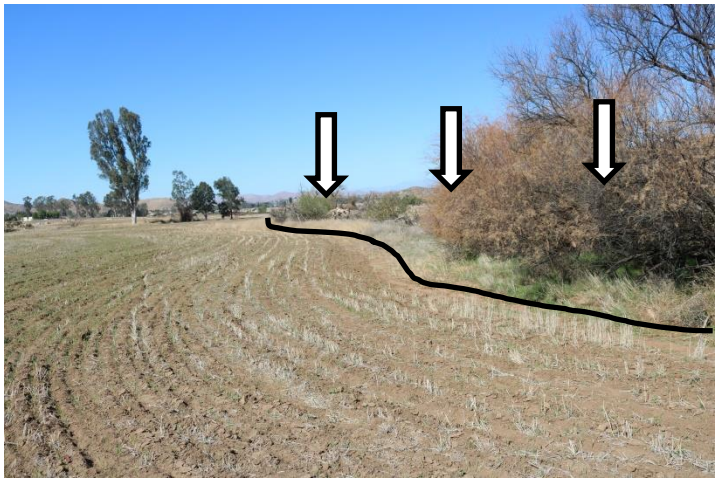
(0023) Chaparral (foreground) open field beyond 12.19.2020

2018 Jurisdictional Area Photographs

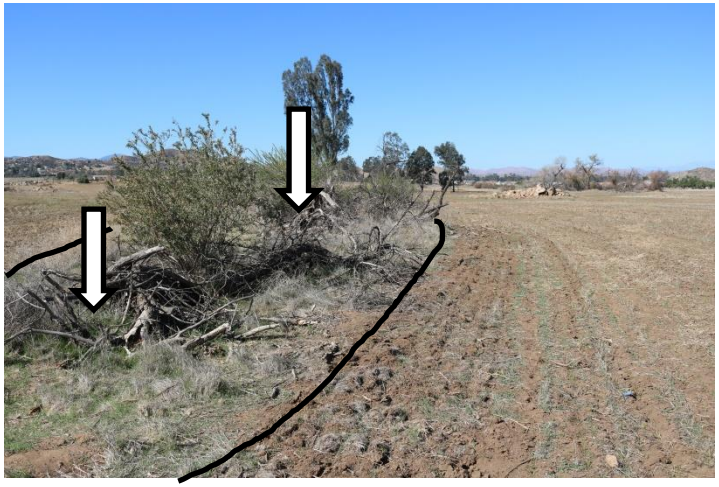
February 7, 2018

Additional Photos of Feature 1b

View of south end of Feature 1b from the southwest, looking northeast, showing the terrain to the south (02.07.2019).



View of west side of Feature 1b, looking northeast, showing the terrain to the west (02.07.2019)



View of east side of Feature 1b, looking northeast, showing the terrain to the east (02.07.2019).

View of the north end of Feature 1b, looking northeast, showing the terrain to the north (02.07.2019).

APPENDIX C

List of plant and wildlife species identified on the Golden Meadows site.

Plants [N=115]

	Scientific Name	**Common Name**
	VASCULAR PLANTS	
	Dicotyledons	
	ADOXACEAE	**MUSKROOT FAMILY**
	Sambucus nigra ssp. *cerulea* (*S. mexicana*)	Mexican elderberry, blue elderberry
	AMARANTHACEAE	**AMARANTH FAMILY**
*	*Amaranthus albus*	Tumbleweed, tumbling pigweed
	ANACARDIACEAE	**SUMAC or CASHEW FAMILY**
*	*Schinus molle*	Peruvian pepper tree
	APIACEAE	**CELERY FAMILY**
	Daucus pusillus	Rattlesnake weed, wild carrot
	ASTERACEAE	**ASTER FAMILY**
	Acourtia microcephala (*Perezia microcephala*)	Scapellote, perezia
	Ambrosia acanthicarpa	Annual bur-sage, annual sandbur
*	*Anthemis cotula*	Mayweed, dog mayweed
	Artemisia californica	California sagebrush
	Baccharis salicifolia (*B. glutinosa*)	Mulefat
	Bebbia juncea	Sweetbush
*	*Centaurea melitensis*	Tocalote
	Chaenactis artemisiifolia	White pincushion, wormwood pincushion
	Corethrogyne filaginifolia var. *filaginifolia* (*Lessingia filaginifolia*)	California-aster, sand-aster
	Deinandra fasciculata (*Hemizonia fasciculata*)	Fascicled tarplant, slender tarweed
	Encelia farinosa	Brittlebush
	Erigeron canadensis (*Conyza canadensis*)	Horseweed, mare's tail
	Eriophyllum confertiflorum	Golden-yarrow
	Eriophyllum multicaule	Many-stem woolly daisy
	Gutierrezia californica (*G. bracteata*)	California matchweed
	Helianthus annuus	Western sunflower
*	*Lactuca serriola*	Prickly lettuce

	Scientific Name	**Common Name**
	Lasthenia californica (L. chrysostoma)	California goldfields
	Layia platyglossa	Tidy-tips
	Logfia filaginoides (Filago californica)	California filago
*	*Matricaria discoidea (Chamomilla suaveolens, M. matricarioides)*	Pineapple weed
	Rafinesquia californica	California chicory
*	*Senecio vulgaris*	Common groundsel
*	*Sonchus oleraceus*	Common sow thistle
	Stephanomeria virgata	Wreath plant
	Stylocline gnaphaloides	Everlasting neststraw
	Tetradymia comosa	Hairy horsebrush, common-thorn
	Uropappus lindleyi (Microseris lindleyi, M. linearifolia)	Silverpuffs
*?	*Xanthium spinosum*	Spiny cocklebur
	BORAGINACEAE	**BORAGE OR WATERLEAF FAMILY**
	Amsinckia intermedia (A. menziesii var. intermedia)	Large flower rancher's fiddleneck
	Cryptantha intermedia	Common cryptantha
	Heliotropium curassavicum	Wild heliotrope
	Pectocarya linearis	Slender pectocarya
	Phacelia minor	Wild Canterbury bells
	Phacelia ramosissima	Branching phacelia
	Plagiobothrys sp.	Popcornflower
	BRASSICACEAE	**MUSTARD FAMILY**
*	*Brassica nigra*	Black mustard
*	*Hirschfeldia incana (Brassica geniculata)*	Shortpod mustard
	Lepidium nitidum	Shining peppergrass
*	*Raphanus sativus*	Wild radish
*	*Sisymbrium irio*	London rocket
*	*Sisymbrium orientale*	Wild mustard, hare's ear cabbage
	Thysanocarpus curvipes	Lacepod
	CACTACEAE	**CACTUS FAMILY**
	Cylindropuntia californica var. *parkeri (Opuntia parryi)*	Valley cholla
	CHENOPODIACEAE	**GOOSEFOOT FAMILY**
*	*Chenopodium murale*	Nettle-leaved goosefoot, lamb's quarters
*	*Salsola tragus*	Russian thistle
	CONVOLVULACEAE	**MORNING-GLORY FAMILY**
	Calystegia macrostegia	Morning-glory

	Scientific Name	Common Name
	Cuscuta californica	Chaparral dodder, witch's hair
CRASSULACEAE		**STONECROP FAMILY**
	Crassula connata (C. erecta)	Pygmy-weed, pygmy stonecrop
CUCURBITACEAE		**GOURD FAMILY, CUCUMBER FAMILY**
	Cucurbita foetidissima	Calabazilla
	Marah macrocarpa	Chilicothe, wild cucumber
EUPHORBIACEAE		**SPURGE FAMILY**
	Croton setiger (C. setigerus, Eremocarpus setiger, E. setigerus)	Turkey-mullein, doveweed
	Euphorbia albomarginata (Chamaesyce albomarginata)	Rattlesnake sandmat, rattlesnake weed
FABACEAE		**LEGUME FAMILY, PEA FAMILY**
	Acmispon americanus (Lotus purshianus, L. unifoliatus)	"Spanish" clover
	Acmispon glaber (Lotus scoparius)	Deerweed
	Lupinus sp.	Unid. lupine
	Lupinus bicolor	Miniature lupine, dove lupine
*	*Medicago polymorpha*	California burclover
*	*Vicia villosa*	Winter vetch
GERANIACEAE		**GERANIUM FAMILY**
*	*Erodium botrys*	Long-beak filaree
*	*Erodium cicutarium*	Redstem filaree
LAMIACEAE		**MINT FAMILY**
*	*Marrubium vulgare*	Horehound
	Salvia apiana	White sage
	Salvia columbariae	Chia
	Salvia mellifera	Black sage
	Trichostema lanceolatum	Vinegar weed
MALVACEAE		**MALLOW FAMILY**
*	*Malva parviflora*	Cheeseweed
MYRSINACEAE		**MYRSINE FAMILY**
*	*Anagallis arvensis*	Scarlet pimpernel
MYRTACEAE		**MYRTLE FAMILY, EUCALYPTUS FAMILY**
*	*Eucalyptus* sp.	Ornamental eucalyptus

	Scientific Name	Common Name
	NYCTAGINACEAE	**FOUR O'CLOCK FAMILY**
	Mirabilis laevis var. *crassifolia (M. californica)*	Wishbone bush
	ONAGRACEAE	**EVENING-PRIMROSE FAMILY**
	Camissonia sp.	Unid. evening-primrose
	Eulobus californica (Camissonia californica)	California false mustard, mustard evening primrose
	PAPAVERACEAE	**POPPY FAMILY**
	Eschscholzia californica	California poppy
	PHRYMACEAE	**LOPSEED FAMILY**
	Mimulus aurantiacus (M. puniceus, M. longiflorus)	Bush monkeyflower,sticky monkeyflower
	Mimulus guttatus	Seep monkeyflower
	PLANTAGINACEAE	**PLANTAIN FAMILY**
	Antirrhinum nuttallianum	Nuttall snapdragon, violet snapdragon
	Keckiella antirrhinoides	Yellow bush-penstemon
	Plantago erecta	California plantain
	POLEMONIACEAE	**PHLOX FAMILY**
	Eriastrum sapphirinum	Sapphire woollystar
	Navarretia hamata	Hooked navarretia
	POLYGONACEAE	**BUCKWHEAT FAMILY**
	Chorizanthe fimbriata	Fringed spineflower
**	*Chorizanthe polygonoides* var. *longispina*	Long-spined spineflower
	Eriogonum fasciculatum var. *foliolosum*	Leafy California wild buckwheat, interior California buckwheat
	Eriogonum fasciculatum var. *polifolium*	Mojave Desert California buckwheat
*	*Polygonum aviculare ssp. depressum (P. arenastrum)*	Common knotweed
*	*Rumex crispus*	Curly dock
	ROSACEAE	**ROSE FAMILY**
	Adenostoma fasciculatum	Chamise
	RUBIACEAE	**MADDER FAMILY, COFFEE FAMILY**
*?	*Galium aparine*	Goose grass, annual bedstraw
	SALICACEAE	**WILLOW FAMILY**
	Populus fremontii ssp. *fremontii*	Fremont cottonwood
	Salix lasiolepis	Arroyo willow

Scientific Name	Common Name
SCROPHULARIACEAE	**FIGWORT FAMILY, SNAPDRAGON FAMILY**
Scrophularia californica	California figwort, coast figwort
SOLANACEAE	**NIGHTSHADE FAMILY**
Datura wrightii (D. meteloides)	Jimsonweed, tolguacha
* *Nicotiana glauca*	Tree tobacco
Solanum americanum *? *(S. nodiflorum)*	White nightshade
TAMARICACEAE	**TAMARISK FAMILY**
* *Tamarix species*	Tamarisk
URTICACEAE	**NETTLE FAMILY**
* *Urtica urens*	Dwarf nettle
ZYGOPHYLLACEAE	**CALTROP FAMILY**
* *Tribulus terrestris*	Puncture vine
Monocotyledons	
AGAVACEAE	**CENTURY PLANT FAMILY, AGAVE FAMILY**
Hesperoyucca whipplei (Yucca whipplei)	Chaparral yucca
LILIACEAE	**LILY FAMILY**
Calochortus splendens	Splendid mariposa lily
POACEAE	**GRASS FAMILY**
* *Avena barbata*	Slender wild oat
* *Avena fatua*	Wild oat
* *Bromus species*	Non-native brome
* *Bromus diandrus (B. rigidus)*	Ripgut brome
* *Bromus madritensis* ssp. *rubens (B. rubens)*	Red brome
* *Hordeum murinum*	Wall barley, hare barley
* *Lamarckia aurea*	Goldentop grass
* *Phalaris species*	Unid. canary grass
* *Schismus barbatus*	Mediterranean schismus
* *Triticum aestivum*	Common wheat (cultivated)
THEMIDACEAE	**BRODIAEA FAMILY**
Dichelostemma capitatum (D. pulchella, Brodiaea pulchella)	Blue dicks, wild hyacinth
Muilla maratima	Common muilla

* non-native species ** special status species

Wildlife [N=54]

Scientific Name	Common Name
VERTEBRATES	
Reptiles [N=3]	
Iguanidae	**Iguanid Lizards**
Sceloporus orcutti	Granite spiny lizard
Uta stansburiana	Side-blotched lizard
Phrynosomatidae	**Spiny Lizards**
** *Phrynosoma blainvillii*	Coast horned lizard
Birds [N=45]	
Accipitridae	**Hawks, Eagles, and Harriers**
** *Accipiter cooperii*	Cooper's hawk
Buteo jamaicensis	Red-tailed hawk
** *Circus cyaneus*	Northern harrier
** *Elanus leucurus*	White-tailed kite (fly over)
Aegithalidae	**Long-tailed Tits**
Psaltriparus minimus	Bushtit
Alaudidae	**Larks**
** *Eremophila alpestris actia*	California horned lark
Ardeidae	**Herons**
** *Ardea herodias*	Great blue heron (fly over)
Cathartidae	**Vultures**
Cathartes aura	Turkey vulture
Charadriidae	**Plovers**
Charadrius vociferus	Killdeer
Columbidae	**Pigeons and Doves**
* *Columba livia*	Rock dove, common pigeon
Zenaida macroura	Mourning dove
Corvidae	**Crows and Jays**
Aphelocoma californica	California scrub jay
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
Cuculidae	**Cuckoos**
Geococcyx californianus	Greater roadrunner
Emberizidae	**Emberizine Sparrows**
Amphispiza belli	Sage sparrow

	Scientific Name	**Common Name**
	Melospiza melodia	Song sparrow
	Pipilo crissalis senicula	California towhee
	Zonotrichia leucophrys	White-crowned sparrow
	Falconidae	**Falcons**
	Falco sparverius	American kestrel
	Fringillidae	**Finches**
	Carduelis psaltria	Lesser goldfinch
	Haemorhous (Carpodacus) mexicanus	House finch
	Hirundinidae	**Swallows**
	Stelgidopteryx serripennis	Northern rough-winged swallow
	Icteridae	**Icterids**
	Agelaius phoeniceus	Red-winged blackbird
	Euphagus cyanocephalus	Brewer's blackbird
	Icterus bullockii	Bullock's oriole
	Sturnella neglecta	Western meadowlark
	Mimidae	**Mockingbirds**
	Mimus polyglottos polyglottos	Northern mockingbird
	Toxostoma redivivum	California thrasher
	Odontophoridae	**Quail**
	Callipepla californica californica	California quail
	Parulidae	**Wood Warblers**
	Dendroica coronata	Yellow-rumped warbler
	Picidae	**Woodpeckers**
	Colaptes auratus	Northern flicker
	Picoides nuttallii	Nuttall's woodpecker
	Polioptilidae	**Gnatcatchers**
	Polioptila caerulea	Blue-gray gnatcatcher
**	*Polioptila californica californica*	Coastal California gnatcatcher
	Sturnidae	**Starlings**
*	*Sturnus vulgaris*	European starling
	Timaliidae	**Babblers**
	Chamaea fasciata	Wrentit
	Trochilidae	**Hummingbirds**
	Calypte anna	Anna's hummingbird

Scientific Name	Common Name
** *Calypte costae*	Costa's hummingbird
Troglodytidae	**Wrens**
Catherpes mexicanus	Canyon wren
Thryomanes bewickii	Bewick's wren
Turdidae	**Thrushes**
Sialia mexicana	Western bluebird
Tyrannidae	**Tyrant Flycatchers**
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Tyrannus verticalis	Western kingbird

Mammals [N=6]

Canidae	**Dogs, Foxes, and Coyotes**
* *Canis domesticus*	Domestic dog
Canis latrans	Coyote
Geomyidae	**Pocket Gophers**
Thomomys bottae	Botta's pocket gopher (sign)
Leporidae	**Rabbits**
** *Lepus californicus bennettii*	Black-tailed jackrabbit
Sylvilagus audubonii	Audubon's cottontail
Sciuridae	**Squirrels**
Spermophilus beecheyi	California ground squirrel

* non-native species
** special status species
Wildlife species list excludes invertebrates.

APPENDIX D

Certification

Certification: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: March 22, 2022 SIGNED: _____

Leslie Irish, Principal, L&L Environmental, Inc.
909-335-9897

1) Fieldwork Performed By:

Leslie Irish
Name

2) Fieldwork Performed By:

_____
Name

3) Fieldwork Performed By:

_____
Name

4) Fieldwork Performed By:

_____
Name

5) Fieldwork Performed By:

_____
Name

6) Fieldwork Performed By:

_____
Name

Check here ___ if adding any additional names / signatures below or on other side of page.

BIOLOGICAL REPORT SUMMARY SHEET

Applicant Name: Richland Communities
Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001
Section, Township and Range: Sections 15 and 16, Township 6 South, Range 3 West
Building and Safety Log Number: _____
Case Number: TR 31194 Lot/Parcel _____ EA Number _____

MARK ITEM(S) SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE of CONCERN	*(Mark Yes, No, or N/A regarding species findings on the referenced site)*		
		Yes	**No**	**n/a**
	Arroyo Southwestern Toad	Yes	No	n/a
X	Blueline Stream(s)	Yes	No	n/a
X	Burrowing Owl (previous surveys)	Yes	No	n/a
	Coachella Valley Fringed-toed Lizard	Yes	No	n/a
X	Coastal California Gnatcatcher (previous surveys)	Yes	No	n/a
X	Coastal Sage Scrub (previous surveys)	Yes	No	n/a
	Delhi Sands Flower-loving Fly	Yes	No	n/a
	Desert Pupfish	Yes	No	n/a
	Desert Slender Salamander	Yes	No	n/a
	Desert Tortoise	Yes	No	n/a
	Flat-tailed Horned Lizard	Yes	No	n/a
	Least Bell's Vireo	Yes	No	n/a
X	Oak Woodlands (previous surveys)	Yes	No	n/a
	Quino Checkerspot Butterfly	Yes	No	n/a
	Riverside Fairy Shrimp	Yes	No	n/a
	Santa Ana River Woolystar	Yes	No	n/a
	San Bernardino Kangaroo Rat	Yes	No	n/a
	Slender-horned Spineflower	Yes	No	n/a
	Stephens' Kangaroo Rat	Yes	No	n/a
X	Vernal Pools	Yes	No	n/a
X	Wetlands	Yes	No	n/a

MARK ITEM(S) SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE of CONCERN	*(Mark Yes, No, or N/A regarding species findings on the referenced site)*		
X	Cooper's Hawk (previous surveys)	Yes	No	n/a
X	California Horned Lark (previous surveys)	Yes	No	n/a
X	Black-tailed Jackrabbit (previous surveys)	Yes	No	n/a
X	Coastal California Gnatcatcher (previous surveys)	Yes	No	n/a
X	White-tailed Kite (previous surveys)	Yes	No	n/a
	Other	Yes	No	n/a

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened, or candidate species by either state, or federal regulations, or for Riverside County as listed by the California Department of Fish and Wildlife Natural Diversity Data Base (CNDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report or habitat assessment.

L & L Environmental, Inc. — Signature and Company Name

March 22, 2022 — Date

_____ — 10(a) Permit Number (if applicable)

_____ — Permit Expiration Date

County Use Only

Received By: _____ Date: _____

PD-B# _____

Attachment E-4

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit two copies to the County)

Case Number: TR 31194 Lot/Parcel No. _____ EA Number _____

Assessor's Parcel Number(s): 360-300-002, -003, -004, -005, -006, -009, 360-350-001

Date: June 20, 2019

Biological Resources: (Check the level of impact that applies to the following questions.)

Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact

a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?

☐ ■ ☐ ☐

b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?

☐ ■ ☐ ☐

c) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, or U. S. Wildlife Service?

☐ ■ ☐ ☐

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

☐ ■ ☐ ☐

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit two copies to the County)

e) Have a substantial adverse effect on any riparian habitat, or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife, or the U.S. Fish and Wildlife Service?

☐ ■ ☐ ☐

f) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption)

☐ ■ ☐ ☐

g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

☐ ■ ☐ ☐

Findings of Fact:

A mapped blueline stream is present onsite and associated with riparian/riverine vegetation.

Six (6) special status species have been identified onsite during past and present surveys (burrowing owl, coastal California gnatcatcher, Cooper's hawk, white-tailed kite, California horned lark, and black-tailed jackrabbit).

Potential nesting habitat for burrowing owl and other bird species protected by the migratory bird treaty act is present onsite.

Proposed Mitigation:

Avoidance and/or onsite or offsite restoration of riparian habitat is recommended.

Preconstruction surveys for burrowing owl and other nesting bird species are recommended prior to disturbance of the site.

Monitoring Recommended:

Source: CGP Fig. VI.36-VI.40
Revised October 1999

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Appendix D. Cultural Resources Assessment and Paleontological Resources Assessment

CONFIDENTIAL -

CONTACT CITY STAFF

Appendix E. Hydrology Analysis Report

Preliminary Hydrology Analysis
Tract Map No. 31194
Golden Meadows – Phase 4
Major Modification

Prepared for

Richland Communities, Inc.

November 2021

Hunsaker &
Associates

Preliminary Hydrology Analysis
Tract Map No. 31194
Golden Meadows – Phase 4
Major Modification

November 2021

Hunsaker & Associates

PRELIMINARY HYDROLOGY ANALYSIS FOR THE MAJOR MODIFICATION OF THE "GOLDEN MEADOWS" DEVELOPMENT TRACT 31194

PREPARED FOR

RICHLAND COMMUNITIES, INC.
23121 ANTONIO PARKWAY
RANCHO SANTA MARGARITA, CA 92688
PHONE NUMBER: (949) 858-4980

RIVERSIDE COUNTY FLOOD CONTROL DISTRICT
COUNTY OF RIVERSIDE, CALIFORNIA

PREPARED BY:

HUNSAKER & ASSOCIATES
IRVINE, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
2900 ADAMS STREET; SUITE A-15
RIVERSIDE CA, 92504
PHONE NUMBER: (951) 352-7200

PREPARED UNDER THE SUPERVISION OF BRIAN R. LOWELL, R.C.E. 74550
MAY 2021
REVISION: NOVEMBER 2021

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SECTION 1 - Project Description

Introduction

The purpose of this report is to present the backup hydrology that will be used for the planning and design of the major modification to the existing 'Golden Meadows', tract 31194 project. This report also serves as the basis for analyzing and designing the storm drain, retention systems and earthen channel within the project site.

Project Description

The proposed modification to the approved hydrology analysis for tract 31194 consists of modifying drainage management areas 'A', 'C' and 'D'. The proposed modifications will increase the residential density and therefore change the hydraulic modeling of the project. This supplemental analysis is intended to provide the backup hydrology calculations to support the proposed modifications to the residential development.

The underlying project known as Tract 31194 "Golden Meadows" consists of 206.8 acres, and proposes the construction of 474 single family homes (103.2 ac.), 7.3 acres of park, 50.0 acres of open space, 2.7 acres of basins and 43.6 acres of paved streets, un-paved trails, and general improvements related to a residential development. The proposed project site is located within the San Jacinto watershed portion Santa Ana River, within the City of Menifee, in the County of Riverside, California. The project site is bounded by Wickerd Road to the north, Ascot Way to the east, vacant land to the south and Evans Road to the west (see included vicinity map).

Existing Conditions

The site is currently in a natural condition, containing grasses and brush. Topographically, the site is generally hilly, with a mild slope toward the north with a topographic relief on the order of 300 feet. The lowest elevation of approximately 1,500 feet above mean sea level (msl) is located in the northwest corner of the site. The highest elevation of approximately 1,800 feet (msl) is located along the westerly property line. The existing drainage pattern of the modification area divides the site into three distinct drainage areas, DMA 'A', 'C' and 'D'. DMA 'A' consists of the eastern most portion of the site, approximately 173.2 acres and drains northwesterly. DMA 'C' consists of the western most portion of the site, approximately 18.6 acres and drains southeasterly. DMA 'D' consists of the south portion of the site and is approximately 60.0 acres and drains northerly. All three drainage areas generally drain as sheet flow or in small natural gullies directly into natural creeks throughout the site.

Proposed Conditions

On-Site

As required by the Riverside Regional Water Quality Control Board (Santa Ana Watershed), and the MS4 Permit (Municipal Separate Storm Sewer System), the proposed grading of this site has been designed to be consistent with the existing drainage patterns. The proposed development will further subdivide the overall hydrological drainage areas into smaller drainage management areas, designated 'A' through 'L'. The major modification to Tract 31194 will revise the drainage pattern of the proposed condition DMA'A', 'C' and 'D'. We are limiting our supplemental analysis to these three areas, please refer to the underlying hydrology analysis prepared by Hunsaker & Associates for information and calculations pertaining to the rest of the development. The revised DMA 'A' comprises of 95.88 acres and is tributary to water quality and detention basin 'A' located in the northwestern most corner of the project. The revised DMA 'C' comprises of 14.19 acres and is tributary to water quality and detention basin 'C' located in the southeastern most corner of the project. The revised DMA 'D' comprises of 54.51 acres and is tributary to water quality and detention 'D' located in the center of the project.

The proposed on-site water quality and detention basins are being designed to meet water quality requirements and mitigate for any increase in run-off associated with the development of areas 'A', 'C' and 'D'. Furthermore, basins A and C are being designed as 'Extended Detention Basins', each which will include a concrete lined forebay, low flow gravel diversion channels, and a sand filter with a metered outlet structure. Please refer to the WQMP and Storm Drain Plans for this project for complete basin design and outlet structure details. Basin D is designed as an infiltration basin, which is sized to capture and infiltrate the water quality volume in its entirety.

The proposed facilities are designed to convey the 100-year storm event, we have analyzed the site based on the pre and post development conditions for the 2-year, 10-year, and 100-year storm events. RCFC&WCD rational and unit hydrograph methodologies were utilized to determine pre and post development flow rates. The results of this analysis are summarized in the following tables.

Analysis – Drainage Management Area 'A'

DMA 'A' is comprised of 95.88 acres. The proposed development will increase the peak flow rate and volume of storm water run-off, the largest peak flow rate increase was experienced during the 2-year 24-hour storm event, where the anticipated flow rate increased by 7.5 cfs, as compared to natural condition. This increase is being mitigated by the proposed extended detention and water quality basin located on the northerly most portion of the site.

DRAINAGE MANAGEMENT AREA 'A' UNIT HYDROGRAPH – PEAK FLOW RATE (cfs)									
	2 YEAR			10 YEAR			100 YEAR		
	Ex	Pro.	Routed	Ex	Pro.	Routed	Ex	Pro.	Routed
1 HOUR	108.4	90.4	**-18.0**	232.9	167.3	**-65.6**	389.4	274.5	**-114.9**
3 HOUR	51.6	39.3	**-12.3**	144.6	89.1	**-55.5**	256.5	155.7	**-100.8**
6 HOUR	44.6	34.4	**-10.2**	140.1	81.9	**-58.2**	255.6	148.5	**-107.1**
24 HOUR	4.6	12.1	**7.5**	44.4	24.8	**-19.6**	102.6	57.2	**-45.4**

The largest storm volume increase was experienced during the 2 year 24 hour storm event, where the anticipated run-off is increased by 4.51 acre feet from the natural condition. This increase is being mitigated by the proposed extended detention and water quality basin located on the northerly most portion of the site.

DRAINAGE MANAGEMENT AREA 'A' UNIT HYDROGRAPH – STORM VOLUME (Ac-Ft)									
	2 YEAR			10 YEAR			100 YEAR		
	Ex	Pro.	Mitigation Volume	Ex	Pro.	Mitigation Volume	Ex	Pro.	Mitigation Volume
1 HOUR	3.23	2.62	**-0.61**	9.46	5.25	**-4.21**	17.46	9.69	**-7.77**
3 HOUR	2.60	3.31	**0.71**	10.6	6.50	**-4.10**	25.00	13.62	**-11.38**
6 HOUR	2.89	4.53	**1.64**	12.6	8.99	**-3.61**	35.67	19.15	**-16.52**
24 HOUR	2.89	7.40	**4.51**	13.0	12.3	**-0.70**	46.32	27.29	**-19.03**

DRAINAGE MANAGEMENT AREA 'A' DEVELOPED CONDITION RATIONAL METHOD SUMMARY				
	AREA (ac.)	TIME OF CONCENTRATION	% IMPERVIOUS	Q (cfs)
2 YEAR	**95.88 ac.**	**14.85 min.**	**27.6%**	**57.4 cfs**
10 YEAR	**95.88 ac.**	**13.66 min.**	**27.6%**	**114.8 cfs**
100 YEAR	**95.88 ac.**	**12.98 min.**	**27.6%**	**192.3 cfs**

Drainage Management Area 'C'

DMA 'C' is comprised of 14.19 acres. The proposed development will increase the peak flow rate and volume of storm water run-off, the largest peak flow rate increase was experienced during the 2-year 1-hour storm event, where the anticipated flow rate increased by 2.8 cfs, as compared to natural condition. This increase is being mitigated by the proposed extended detention and water quality basin located on the northerly most portion of the site.

DRAINAGE MANAGEMENT AREA 'C' UNIT HYDROGRAPH – PEAK FLOW RATE (cfs)									
	2 YEAR			10 YEAR			100 YEAR		
	Ex	Pro.	Routed	Ex	Pro.	Routed	Ex	Pro.	Routed
1 HOUR	14.7	17.5	**2.8**	31.2	31.8	**0.6**	51.9	51.5	**-0.4**
3 HOUR	6.0	6.5	**0.5**	17.4	14.6	**-2.8**	30.9	25.4	**-5.5**
6 HOUR	5.1	5.9	**0.8**	16.9	14.4	**-2.5**	31.0	25.5	**-5.5**
24 HOUR	0.5	1.8	**1.3**	4.4	3.5	**-0.9**	10.9	8.3	**-2.6**

The largest storm volume increase was experienced during the 2 year 24 hour storm event, where the anticipated run-off is increased by 0.76 acre feet from the natural condition. This increase is being mitigated by the proposed sand filter basin located on the southeasterly most portion of the site.

DRAINAGE MANAGEMENT AREA 'C' UNIT HYDROGRAPH – STORM VOLUME (Ac-Ft)									
	2 YEAR			10 YEAR			100 YEAR		
	Ex	Pro.	Mitigation Volume	Ex	Pro.	Mitigation Volume	Ex	Pro.	Mitigation Volume
1 HOUR	0.32	0.38	**0.06**	0.96	0.74	**-0.22**	1.84	1.39	**-0.45**
3 HOUR	0.25	0.47	**0.22**	0.99	0.92	**-0.07**	2.57	1.94	**-0.63**
6 HOUR	0.28	0.65	**0.37**	1.21	1.28	**0.07**	3.60	2.72	**-0.88**
24 HOUR	0.31	1.07	**0.76**	1.12	1.76	**0.64**	4.48	3.87	**-0.61**

DRAINAGE MANAGEMENT AREA 'C' DEVELOPED CONDITION RATIONAL METHOD SUMMARY				
	AREA (ac.)	TIME OF CONCENTRATION	% IMPERVIOUS	Q (cfs)
2 YEAR	**14.19 ac.**	**10.38 min.**	**29.2 %**	**11.3 cfs**
10 YEAR	**14.19 ac.**	**10.25 min.**	**29.2 %**	**20.1 cfs**
100 YEAR	**14.19 ac.**	**10.17 min.**	**29.2 %**	**36.9 cfs**

Drainage Management Area 'D'

DMA 'D' is comprised of 54.51 acres. The proposed development will increase the peak flow rate and volume of storm water run-off, the largest peak flow rate increase was experienced during the 2-year 3-hour storm event, where the anticipated flow rate increased by 9.8 cfs, as compared to natural condition. This increase is being mitigated by the proposed extended detention and water quality basin located on the northerly most portion of the site.

DRAINAGE MANAGEMENT AREA 'D' UNIT HYDROGRAPH – PEAK FLOW RATE (cfs)									
	2 YEAR			10 YEAR			100 YEAR		
	Ex	Pro.	Routed	Ex	Pro.	Routed	Ex	Pro.	Routed
1 HOUR	45.0	54.0	**9.0**	97.0	98.4	**1.4**	166.5	161.5	**-5.0**
3 HOUR	13.2	23.0	**9.8**	48.0	50.9	**2.9**	92.1	89.4	**-2.7**
6 HOUR	10.7	19.8	**9.1**	43.8	47.6	**3.8**	88.0	86.4	**-1.6**
24 HOUR	1.6	7.6	**6.0**	9.6	13.8	**4.2**	32.3	32.3	**0.0**

The largest storm volume increase was experienced during the 10 year 24 hour storm event, where the anticipated run-off is increased by 5.26 acre feet from the natural condition. This increase is being mitigated by the proposed infiltration basin located on the easterly most portion of the drainage management area.

DRAINAGE MANAGEMENT AREA 'D' UNIT HYDROGRAPH – STORM VOLUME (Ac-Ft)									
	2 YEAR			10 YEAR			100 YEAR		
	Ex	Pro.	Mitigation Volume	Ex	Pro.	Mitigation Volume	Ex	Pro.	Mitigation Volume
1 HOUR	0.90	1.56	**0.66**	2.69	2.97	**0.28**	5.68	5.50	**-0.18**
3 HOUR	0.64	2.03	**1.39**	2.49	3.77	**1.28**	7.56	7.66	**0.10**
6 HOUR	0.73	2.82	**2.09**	3.06	5.27	**2.21**	10.16	10.74	**0.58**
24 HOUR	1.00	4.65	**3.65**	2.32	7.58	**5.26**	12.13	15.59	**3.46**

DRAINAGE MANAGEMENT AREA 'D' DEVELOPED CONDITION RATIONAL METHOD SUMMARY				
	AREA (ac.)	TIME OF CONCENTRATION	% IMPERVIOUS	Q (cfs)
2 YEAR	**54.51 ac.**	**19.12 min.**	**45.0 %**	**36.3 cfs**
10 YEAR	**54.51 ac.**	**18.19 min.**	**45.0 %**	**71.1 cfs**
100 YEAR	**54.51 ac.**	**17.56 min.**	**45.0 %**	**122.1 cfs**

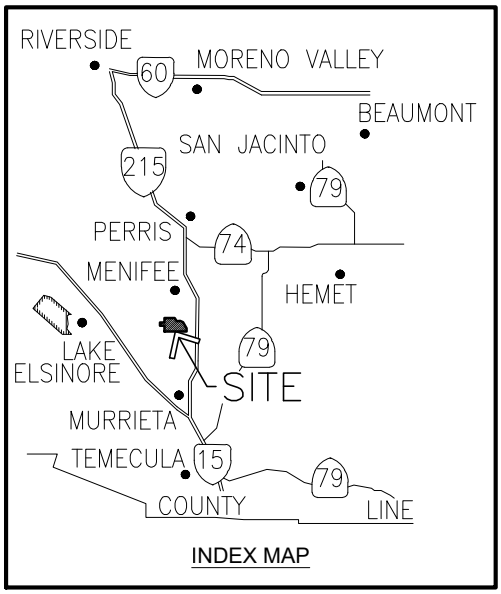
Methodology

This hydrology report is to be used only to analyze flow to, through, and out of the site using the Riverside County Rational Method. In regard to pipe sizing, the hydrology programs were utilized only as a tool for obtaining preliminary sizing of the storm drain facilities by allowing the program to determine minimum pipe sizes. The actual storm drain system and pipe sizes shall be designed per Riverside County Flood Control District criteria. Civil Design Version 7.0 Computer Software Program and AES Engineering Software 2011 version were used in generating the hydrological and hydraulic analysis for this report.

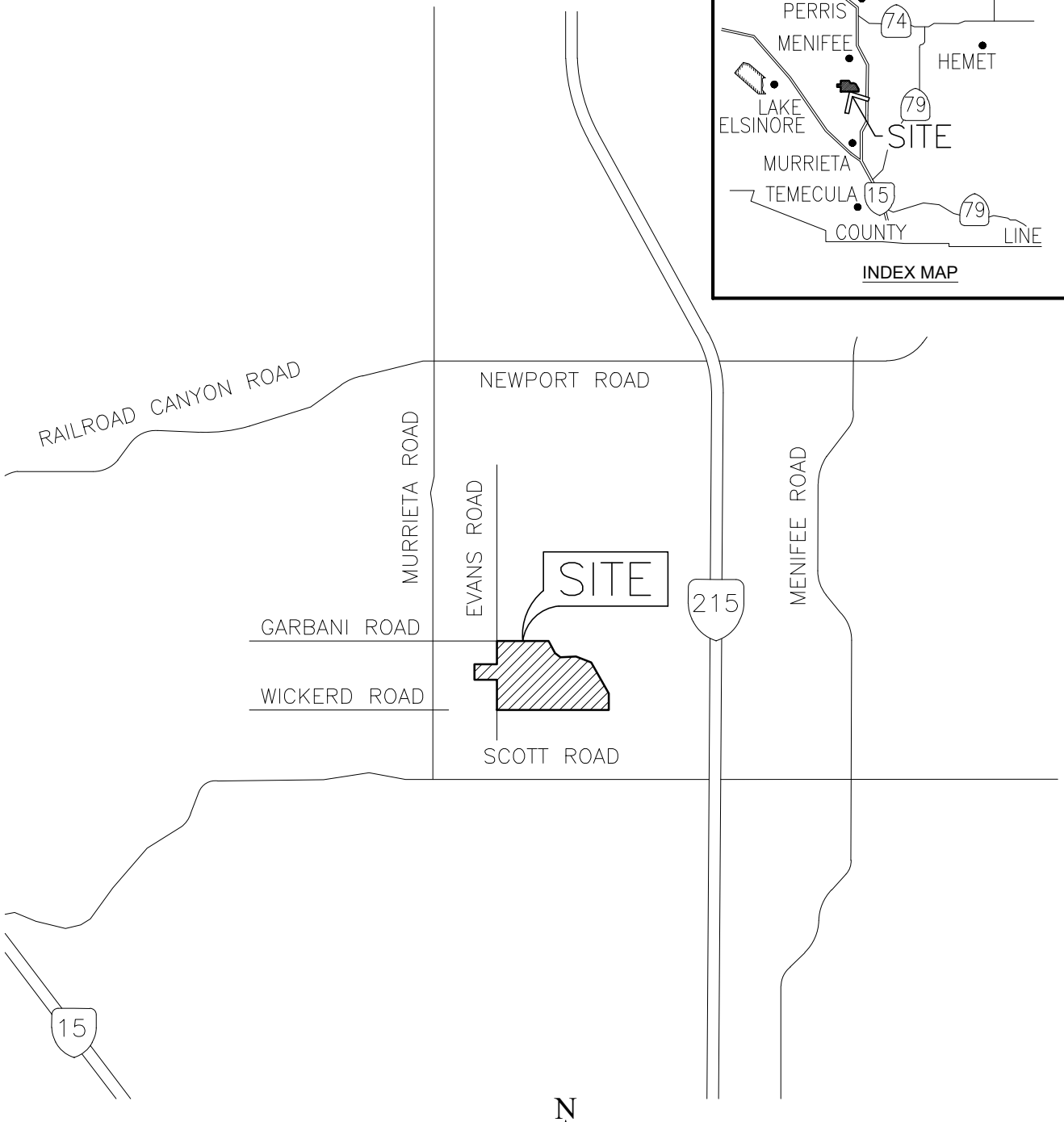
Conclusion

The development of this project does not propose a significant change over the existing conditions as illustrated in the previous tables. Peak flow rates however, did increase as would be expected with the addition of impervious area. This increase in flow rate and any increase in run-off volume will be mitigated by the proposed detention and water quality basins throughout the site.

Based upon the results of this report, it is concluded that drainage facilities discussed above will adequately protect the site area from flood damage associated with the 100-year storm event. The proposed facilities, with ultimate development and adequate maintenance, will convey flows safely through the site area in accordance with Riverside County requirements.



INDEX MAP



NOT TO SCALE

HUNSAKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

FIGURE 1: VICINITY MAP

THOMAS BROTHERS MAPS:
PAGE 868, GRID B-6, B-7, C-6, C-7, D-6 & D-7

H:\00546\Planning\WQMP – Preliminary\Parts\Appendix 1 – Maps\00546-Vicinity-Fig-1.dwg

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N
W HUNSAKER E
S

FIGURE 2: AERIAL PHOTOGRAPH

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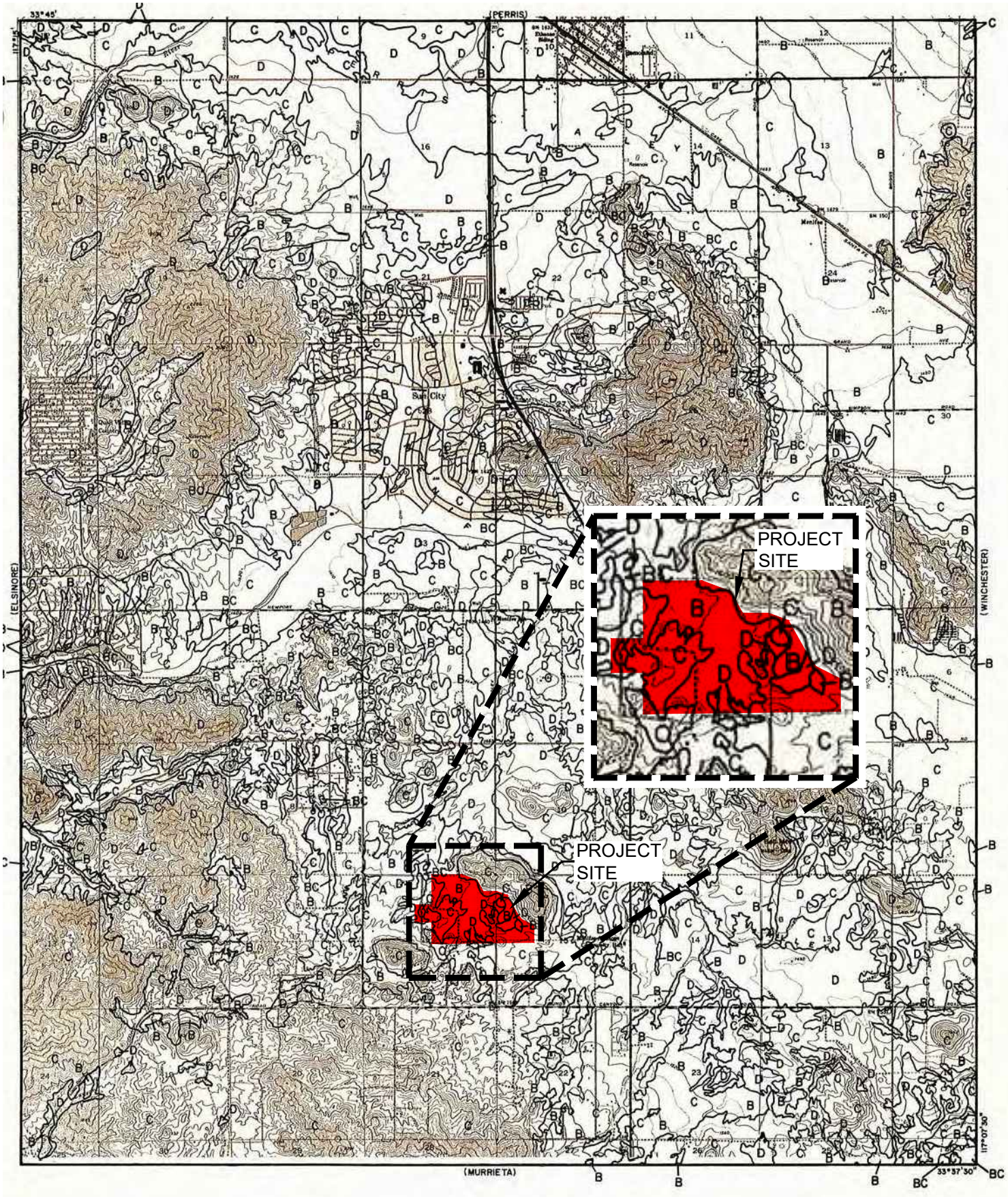
SECTION 2 - Riverside County Flood Control Data

Hydrologic Soils Group Map

Precipitation Intensity Data



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

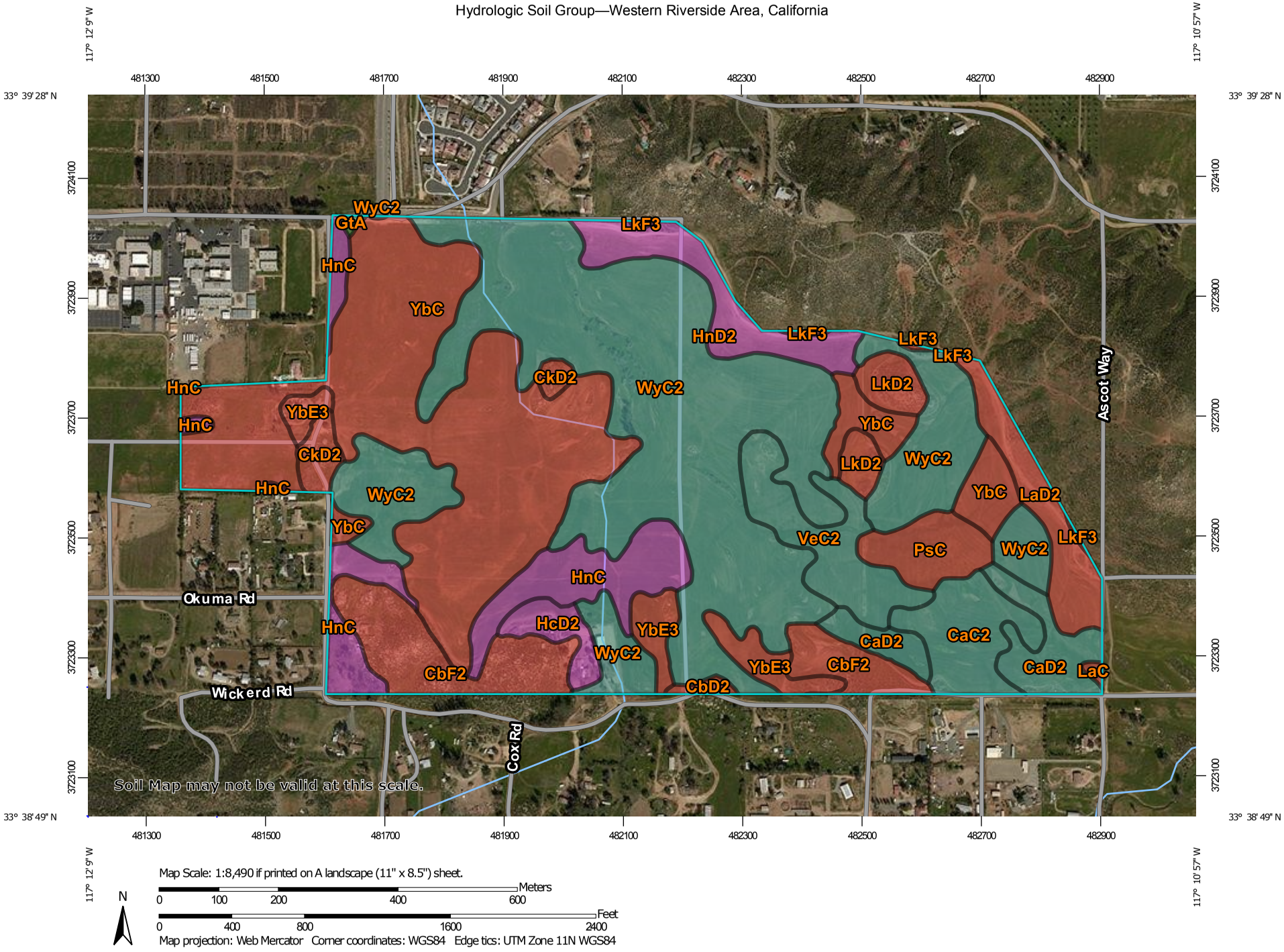
HYDROLOGY MANUAL

N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR ROMOLAND

PLATE C-I.42



Map Scale: 1:8,490 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 11, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 24, 2015—Feb 26, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CaC2	Cajalco fine sandy loam, 2 to 8 percent slopes, eroded	C	7.5	3.3%
CaD2	Cajalco fine sandy loam, 8 to 15 percent slopes, eroded	C	7.3	3.3%
CbD2	Cajalco rocky fine sandy loam, 5 to 15 percent slopes, eroded	D	0.6	0.3%
CbF2	Cajalco rocky fine sandy loam, 15 to 50 percent slopes, eroded	D	13.6	6.1%
CkD2	Cieneba rocky sandy loam, 8 to 15 percent slopes, eroded	D	2.5	1.1%
GtA	Grangeville fine sandy loam, drained, 0 to 2 percent sl opes	A/D	0.2	0.1%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	A	2.8	1.2%
HnC	Honcut sandy loam, 2 to 8 percent slopes	A	13.6	6.1%
HnD2	Honcut sandy loam, 8 to 15 percent slopes, eroded	A	7.6	3.4%
LaC	Las Posas loam, 2 to 8 percent slopes	D	0.2	0.1%
LaD2	Las Posas loam, 8 to 15 percent slopes, eroded	D	6.7	3.0%
LkD2	Las Posas rocky loam, 8 to 15 percent slopes, eroded	D	3.8	1.7%
LkF3	Las Posas rocky loam, 15 to 50 percent slopes, severely eroded	D	0.4	0.2%
PsC	Porterville clay, moderately deep, 2 to 8 percent slopes	D	4.8	2.2%
VeC2	Vallecitos loam, thick solum variant, 2 to 8 percent slopes, eroded	C	9.1	4.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
WyC2	Wyman loam, 2 to 8 percent slopes, eroded	C	79.8	35.7%
YbC	Yokohl loam, 2 to 8 percent slopes	D	57.0	25.5%
YbE3	Yokohl loam, 8 to 25 percent slopes, severely eroded	D	5.9	2.6%
Totals for Area of Interest			**223.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

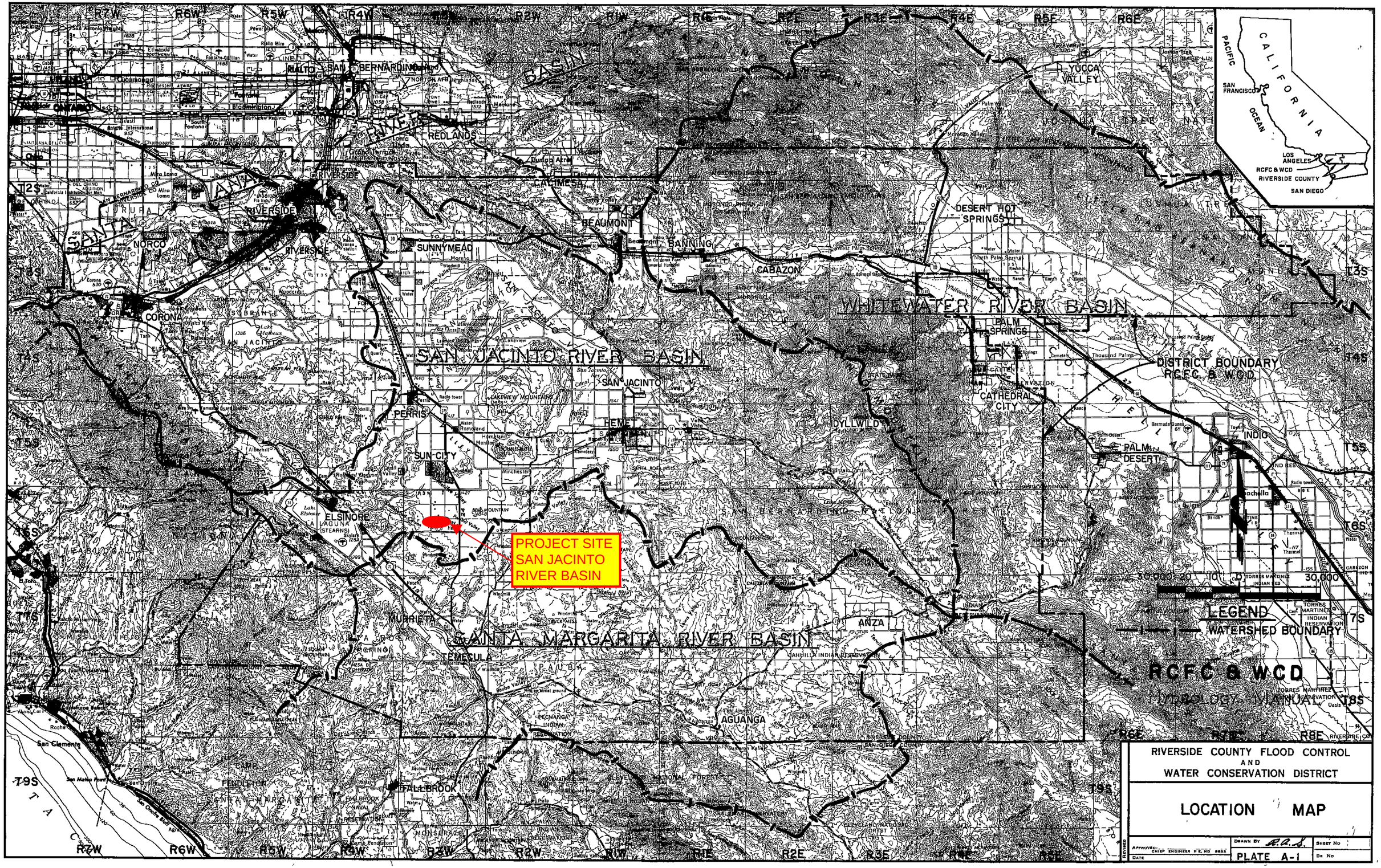
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

LOCATION MAP

DRAWN BY R.A.S.

PLATE A-1

PROJECT SITE
SLOPE=0.53

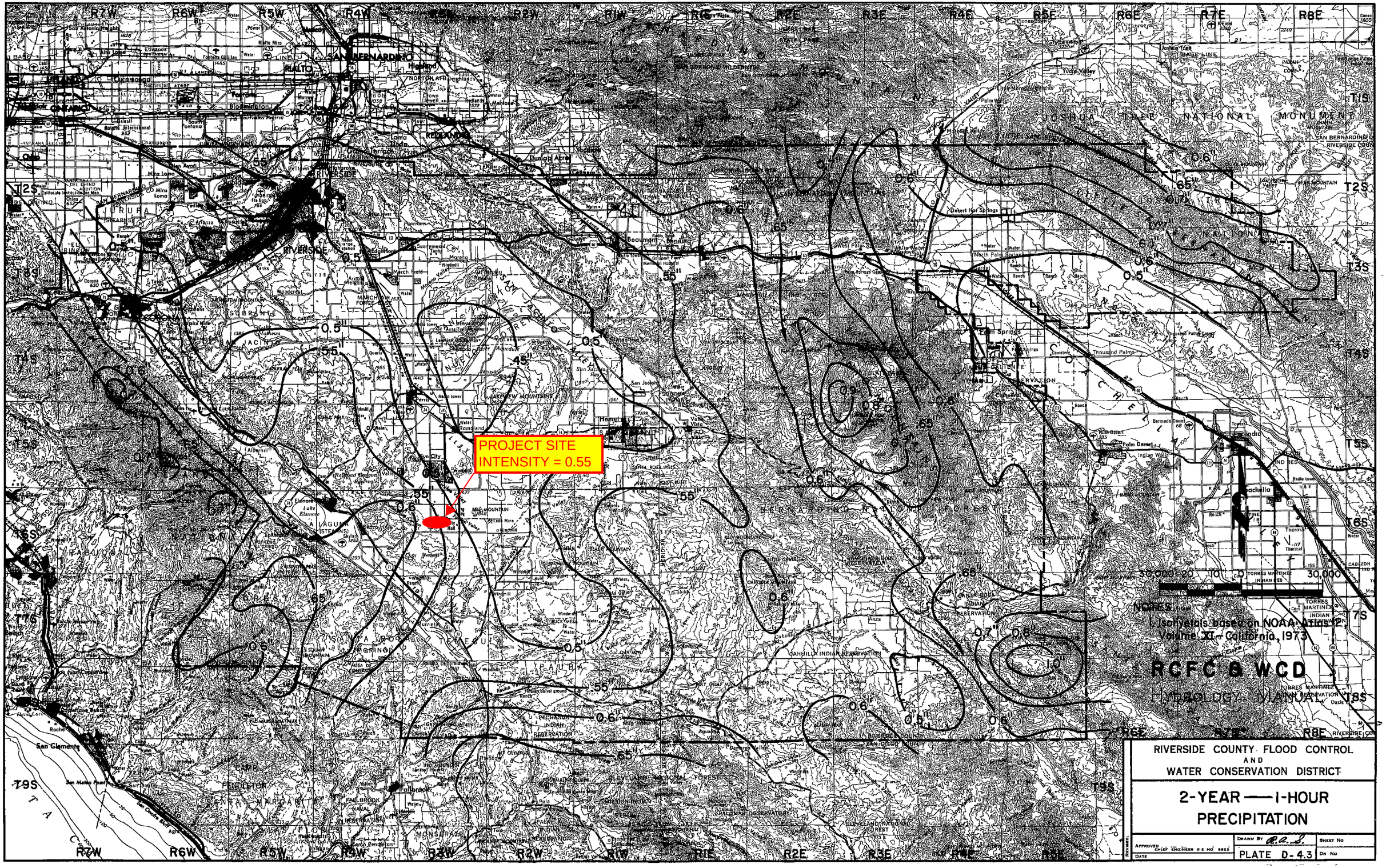
NOTES:
1. Slope of Intensity-Duration Curve based on District analysis of automatic recording rain gage records

RCFC & WCD
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

SLOPE OF INTENSITY DURATION CURVE

APPROVED CHIEF ENGINEER R.E. NO. 8824	DRAWN BY R.A.S.	SHEET NO
DATE	PLATE D-4.6	DR NO


PROJECT SITE
INTENSITY = 0.55
NOTES
1. Isohyetals based on NOAA Atlas 2, Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4.3
SAN BERNARDINO
RIVERSIDE
JOSHUA TREE NATIONAL MONUMENT
Palm Springs
Beaumont
Hemet
Fallbrook
San Clemente
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
T1S
T2S
T3S
T4S
T5S
T6S
T7S
T8S
T9S

PROJECT SITE
INTENSITY = 1.3
NOTES
1. Isohyetals based on NOAA Atlas 2, Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
100-YEAR —— 1-HOUR PRECIPITATION
PLATE D-4.4

PROJECT SITE
INTENSITY = 0.85

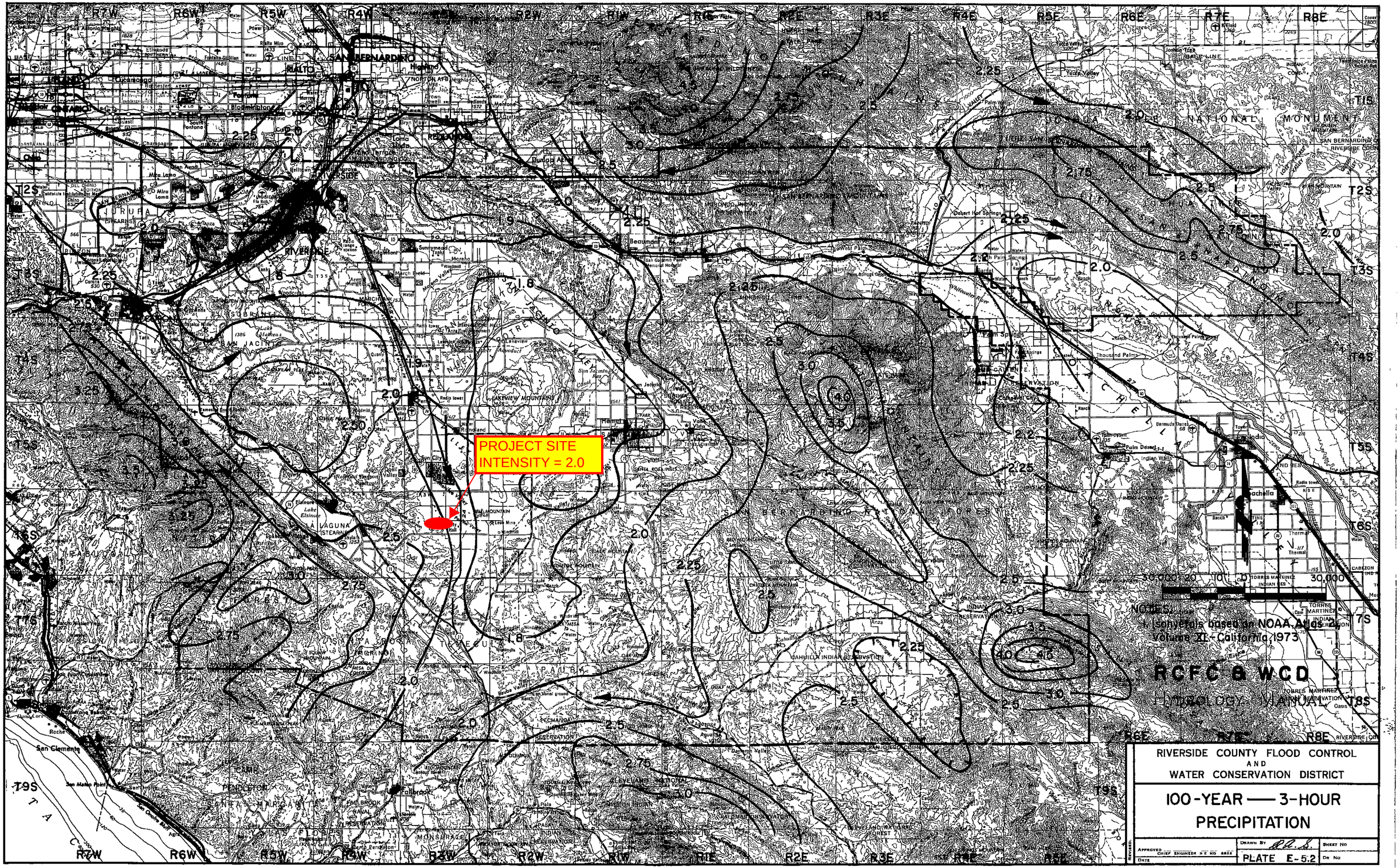
Notes:
Isohyetals based on NOAA Atlas 2
Volume XI - California, 1973.

RCFC & WCD

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

2-YEAR — 3-HOUR
PRECIPITATION

APPROVED CHIEF ENGINEER R.E. NO. 6825	DRAWN BY R.A.S.	SHEET NO
DATE	PLATE E-5.1	DR NO


PROJECT SITE
INTENSITY = 2.0
NOTES:
1. Isohyetals based on NOAA Atlas 2
Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 3-HOUR
PRECIPITATION
PLATE E-5.2

PROJECT SITE
INTENSITY = 1.2

NOTES
1. Isohyetals from NOAA Atlas 2, Volume XI - California, 1973

RCFC & WCD
HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

2-YEAR — 6-HOUR
PRECIPITATION

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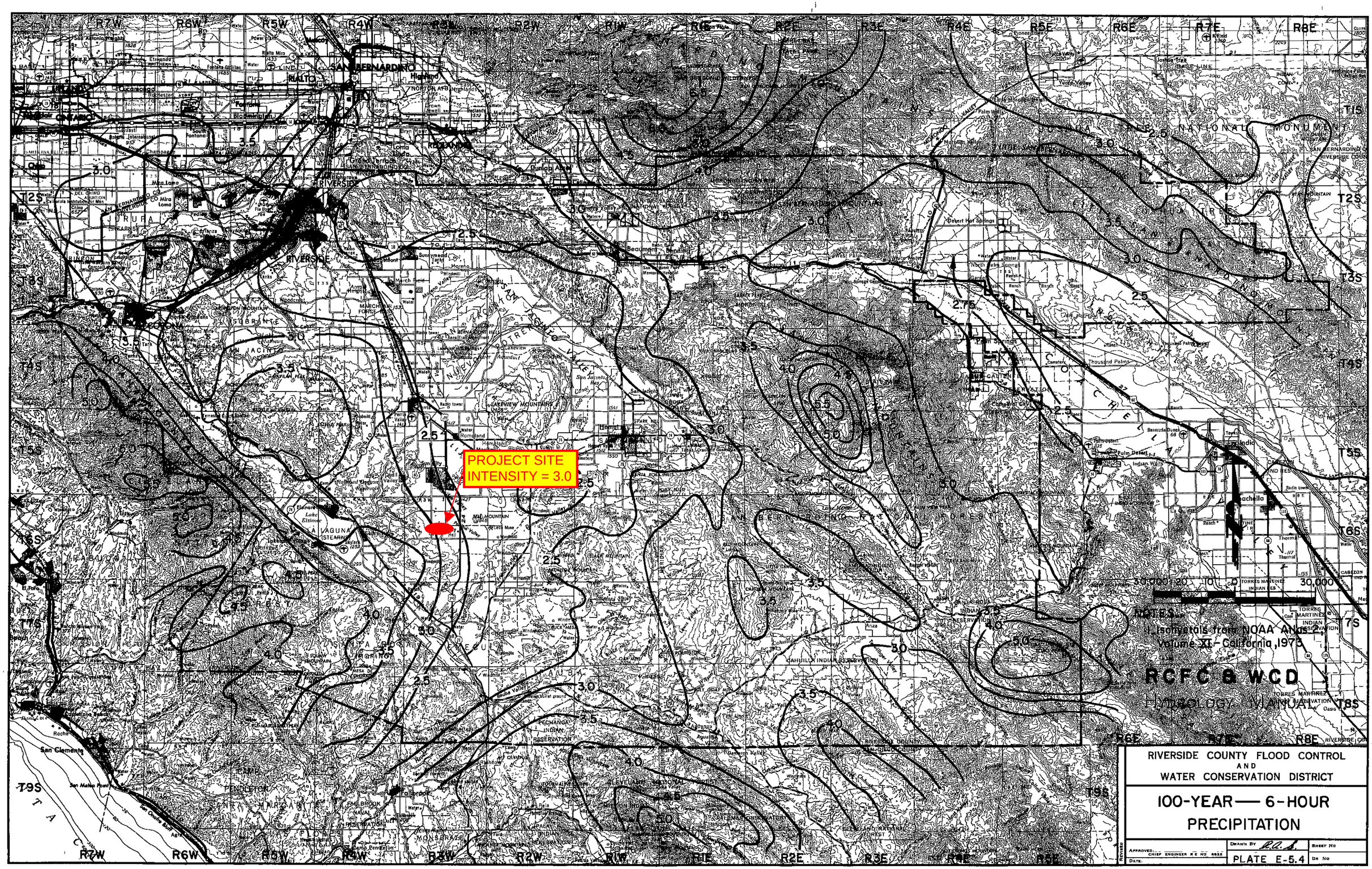
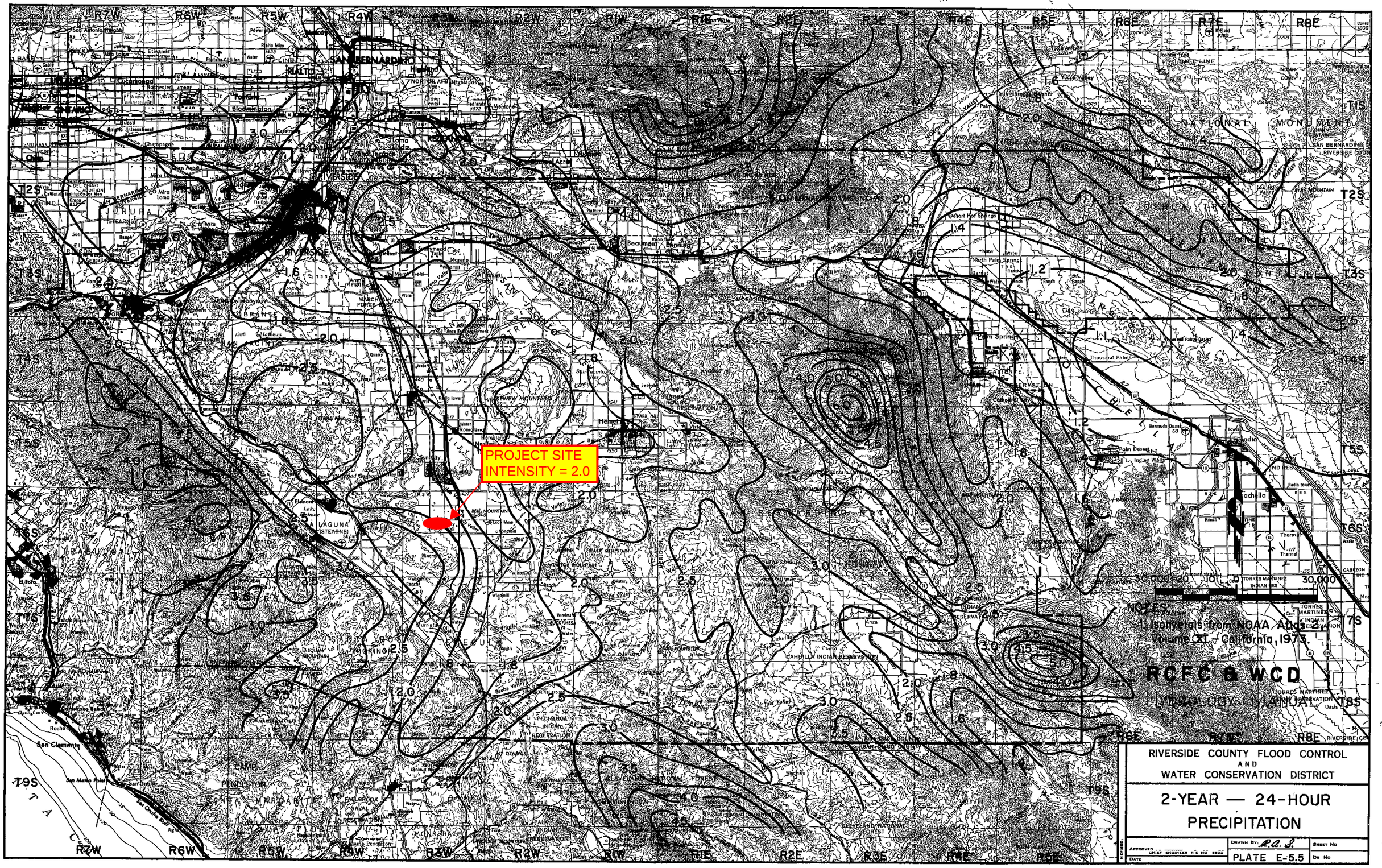
DATE	PLATE E-5.3	DR NO


PROJECT SITE
INTENSITY = 3.0
Isohyetals from NOAA Atlas 2,
Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 6-HOUR
PRECIPITATION
PLATE E-5.4

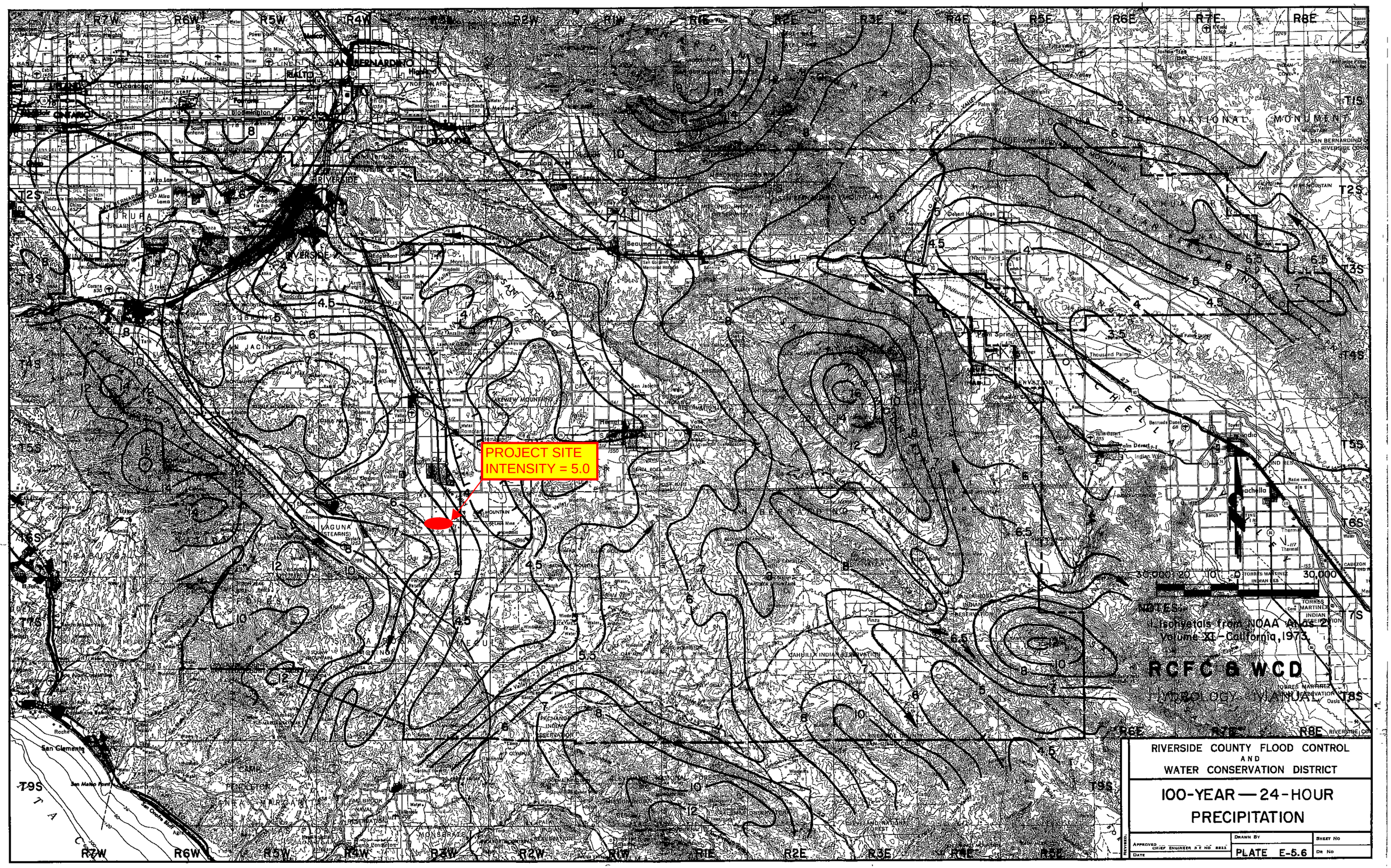


RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

2-YEAR — 24-HOUR PRECIPITATION

APPROVED CHIEF ENGINEER R.E. NO. 8822	DRAWN BY: R.C.S.	SHEET NO
DATE	PLATE E-5.5	DR NO

REVISED


PROJECT SITE
INTENSITY = 5.0
Isohyetals from NOAA Atlas 2
Volume XI - California, 1973
RCFC & WCD
HYDROLOGY MANUAL
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
PLATE E-5.6
SHEET NO
DR NO
DRAWN BY
APPROVED CHIEF ENGINEER R.C.F.C. & W.C.D.
DATE
REVISED

SECTION 3 – Hydrology Calculations

- Rational Hydrology Analysis
- Unit-Hydrograph Analysis

Area A

- Area 'A' – 2 Year Pre-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 02/08/19  File:EXA002.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6407

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.550(In/Hr)
Slope of intensity duration curve = 0.5300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   800.000(Ft.)
Top (of initial area) elevation =  1758.000(Ft.)
Bottom (of initial area) elevation =  1590.000(Ft.)
Difference in elevation =   168.000(Ft.)
Slope =    0.21000  s(percent)=      21.00
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.497 min.
Rainfall intensity =      1.386(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.554
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      6.021(CFS)
Total initial stream area =        7.850(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1590.000(Ft.)
End of natural channel elevation =   1533.000(Ft.)
Length of natural channel  =  1213.000(Ft.)
Estimated mean flow rate at midpoint of channel =     22.164(CFS)
```

```
Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   6.68(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0470
Corrected/adjusted channel slope =  0.0470
Travel time =    3.03 min.     TC =   13.52  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.554
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.050
Decimal fraction soil group D = 0.200
RI index for soil(AMC 1)  =  63.84
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.211(In/Hr) for a     2.0 year storm
Subarea runoff =     28.268(CFS) for     42.090(Ac.)
Total runoff =     34.289(CFS)       Total area =      49.940(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of natural channel elevation =   1533.000(Ft.)
End of natural channel elevation =   1514.000(Ft.)
Length of natural channel  =  1843.000(Ft.)
Estimated mean flow rate at midpoint of channel =     60.239(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   4.15(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0103
Corrected/adjusted channel slope =  0.0103
Travel time =    7.41 min.     TC =   20.93  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.580
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.650
RI index for soil(AMC 1)  =  71.52
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.961(In/Hr) for a     2.0 year storm
Subarea runoff =     42.120(CFS) for     75.590(Ac.)
Total runoff =     76.408(CFS)       Total area =     125.530(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    125.530(Ac.)
Runoff from this stream =     76.408(CFS)
Time of concentration =   20.93 min.
Rainfall intensity =     0.961(In/Hr)


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```
Process from Point/Station      105.000 to Point/Station      106.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   500.000(Ft.)
Top (of initial area) elevation =  1525.000(Ft.)
Bottom (of initial area) elevation =  1519.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.01200  s(percent)=       1.20
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.418 min.
Rainfall intensity =      1.130(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.617
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.750
RI index for soil(AMC 1)  =  72.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      6.749(CFS)
Total initial stream area =        9.680(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      104.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------
Top of natural channel elevation =   1519.000(Ft.)
End of natural channel elevation =   1514.000(Ft.)
Length of natural channel  =   634.000(Ft.)
Estimated mean flow rate at midpoint of channel =     11.909(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   2.32(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
        Normal channel slope =  0.0079
Corrected/adjusted channel slope =  0.0079
Travel time =    4.55 min.     TC =   19.97  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.549
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  67.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.985(In/Hr) for a     2.0 year storm
Subarea runoff =      8.004(CFS) for     14.800(Ac.)
Total runoff =     14.753(CFS)        Total area =      24.480(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      104.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     24.480(Ac.)
Runoff from this stream =     14.753(CFS)
Time of concentration =   19.97 min.
Rainfall intensity =     0.985(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1       76.408     20.93                0.961
2       14.753     19.97                0.985
Largest stream flow has longer time of concentration
Qp =     76.408 + sum of
          Qb         Ia/Ib
          14.753 *    0.975 =     14.391
Qp =     90.800

Total of 2 streams to confluence:
Flow rates before confluence point:
      76.408      14.753
Area of streams before confluence:
      125.530       24.480
Results of confluence:
Total flow rate =     90.800(CFS)
Time of concentration =    20.929 min.
Effective stream area after confluence =    150.010(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      107.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1514.000(Ft.)
End of natural channel elevation =   1504.000(Ft.)
Length of natural channel  =   897.000(Ft.)
Estimated mean flow rate at midpoint of channel =     98.326(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   4.99(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0111
Corrected/adjusted channel slope =  0.0111
Travel time =    3.00 min.     TC =   23.93  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.531
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  68.18
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.895(In/Hr) for a     2.0 year storm
Subarea runoff =     11.822(CFS) for     24.870(Ac.)
Total runoff =    102.622(CFS)       Total area =     174.880(Ac.)
End of computations, total study area =          174.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  83.8
```

- Area 'A' – 10 Year Pre-Development Condition – Rational Method[R]

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
      Rational Hydrology Study        Date: 04/30/21  File:EXA010.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION RATIONAL METHOD - 100 YEAR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.859(In/Hr)
Slope of intensity duration curve = 0.5300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   800.000(Ft.)
Top (of initial area) elevation =  1758.000(Ft.)
Bottom (of initial area) elevation =  1590.000(Ft.)
Difference in elevation =   168.000(Ft.)
Slope =    0.21000  s(percent)=      21.00
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.497 min.
Rainfall intensity =      2.163(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.767
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     13.017(CFS)
Total initial stream area =        7.850(Ac.)
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Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1590.000(Ft.)
End of natural channel elevation =   1533.000(Ft.)
Length of natural channel  =  1213.000(Ft.)
Estimated mean flow rate at midpoint of channel =     47.773(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   8.28(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0470
Corrected/adjusted channel slope =  0.0470
Travel time =    2.44 min.     TC =   12.94  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.772
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.050
Decimal fraction soil group D = 0.200
RI index for soil(AMC 2)  =  80.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.936(In/Hr) for a    10.0 year storm
Subarea runoff =     62.653(CFS) for     41.920(Ac.)
Total runoff =     75.670(CFS)  Total area =      49.770(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1533.000(Ft.)
End of natural channel elevation =   1514.000(Ft.)
Length of natural channel  =  1843.000(Ft.)
Estimated mean flow rate at midpoint of channel =    131.620(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   5.24(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0103
Corrected/adjusted channel slope =  0.0103
Travel time =    5.87 min.     TC =   18.80  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
```

```
Runoff Coefficient = 0.791
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.650
RI index for soil(AMC 2)  =  85.95
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.588(In/Hr) for a    10.0 year storm
Subarea runoff =     92.490(CFS) for     73.600(Ac.)
Total runoff =    168.160(CFS)  Total area =     123.370(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    123.370(Ac.)
Runoff from this stream =    168.160(CFS)
Time of concentration =   18.80 min.
Rainfall intensity =     1.588(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   790.000(Ft.)
Top (of initial area) elevation =  1543.000(Ft.)
Bottom (of initial area) elevation =  1522.000(Ft.)
Difference in elevation =    21.000(Ft.)
Slope =    0.02658  s(percent)=       2.66
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.791 min.
Rainfall intensity =      1.742(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.802
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.750
RI index for soil(AMC 2)  =  86.25
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      9.082(CFS)
Total initial stream area =        6.500(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      104.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of natural channel elevation =   1519.000(Ft.)
End of natural channel elevation =   1514.000(Ft.)
Length of natural channel  =   634.000(Ft.)
Estimated mean flow rate at midpoint of channel =     21.881(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   2.73(Ft/s)
```

```
Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0079
Corrected/adjusted channel slope =  0.0079
Travel time =    3.88 min.     TC =   19.67  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.769
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  83.50
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.551(In/Hr) for a    10.0 year storm
Subarea runoff =     21.854(CFS) for     18.320(Ac.)
Total runoff =     30.936(CFS)  Total area =      24.820(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      104.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     24.820(Ac.)
Runoff from this stream =     30.936(CFS)
Time of concentration =   19.67 min.
Rainfall intensity =     1.551(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1      168.160     18.80                1.588
2       30.936     19.67                1.551
Largest stream flow has longer or shorter time of concentration
Qp =    168.160 + sum of
         Qa          Tb/Ta
         30.936 *    0.956 =     29.580
Qp =    197.740

Total of 2 streams to confluence:
Flow rates before confluence point:
     168.160      30.936
Area of streams before confluence:
      123.370       24.820
Results of confluence:
Total flow rate =    197.740(CFS)
Time of concentration =    18.804 min.
Effective stream area after confluence =    148.190(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      107.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1514.000(Ft.)
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```
End of natural channel elevation =   1504.000(Ft.)
Length of natural channel  =   897.000(Ft.)
Estimated mean flow rate at midpoint of channel =    214.446(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   6.33(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0111
Corrected/adjusted channel slope =  0.0111
Travel time =    2.36 min.     TC =   21.17  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.767
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.300
RI index for soil(AMC 2)  =  83.70
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.491(In/Hr) for a    10.0 year storm
Subarea runoff =     28.626(CFS) for     25.040(Ac.)
Total runoff =    226.366(CFS)  Total area =     173.230(Ac.)
End of computations, total study area =          173.23 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  83.7
```

- Area 'A' – 100 Year Pre-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
      Rational Hydrology Study        Date: 04/30/21  File:EXA100.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION RATIONAL METHOD - 100 YEAR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual


Storm event (year) =  100.00 Antecedent Moisture Condition = 3

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.300(In/Hr)
Slope of intensity duration curve = 0.5300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   800.000(Ft.)
Top (of initial area) elevation =  1758.000(Ft.)
Bottom (of initial area) elevation =  1590.000(Ft.)
Difference in elevation =   168.000(Ft.)
Slope =    0.21000  s(percent)=      21.00
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.497 min.
Rainfall intensity =      3.275(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     22.114(CFS)
```

```
Total initial stream area =        7.850(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1590.000(Ft.)
End of natural channel elevation =   1533.000(Ft.)
Length of natural channel  =  1213.000(Ft.)
Estimated mean flow rate at midpoint of channel =     81.161(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   9.67(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0470
Corrected/adjusted channel slope =  0.0470
Travel time =    2.09 min.     TC =   12.59  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.863
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.050
Decimal fraction soil group D = 0.200
RI index for soil(AMC 3)  =  91.36
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.974(In/Hr) for a   100.0 year storm
Subarea runoff =    107.650(CFS) for     41.920(Ac.)
Total runoff =    129.765(CFS)  Total area =      49.770(Ac.)


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Process from Point/Station      103.000 to Point/Station      104.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1533.000(Ft.)
End of natural channel elevation =   1514.000(Ft.)
Length of natural channel  =  1843.000(Ft.)
Estimated mean flow rate at midpoint of channel =    225.713(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   6.18(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0103
Corrected/adjusted channel slope =  0.0103
Travel time =    4.97 min.     TC =   17.56  min.


 Adding area flow to channel
```

```
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.872
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.650
RI index for soil(AMC 3)  =  94.38
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.494(In/Hr) for a   100.0 year storm
Subarea runoff =    160.075(CFS) for     73.600(Ac.)
Total runoff =    289.840(CFS)  Total area =     123.370(Ac.)


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Process from Point/Station      103.000 to Point/Station      104.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    123.370(Ac.)
Runoff from this stream =    289.840(CFS)
Time of concentration =   17.56 min.
Rainfall intensity =     2.494(In/Hr)


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Process from Point/Station      105.000 to Point/Station      106.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   790.000(Ft.)
Top (of initial area) elevation =  1543.000(Ft.)
Bottom (of initial area) elevation =  1522.000(Ft.)
Difference in elevation =    21.000(Ft.)
Slope =    0.02658  s(percent)=       2.66
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.791 min.
Rainfall intensity =      2.638(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.750
RI index for soil(AMC 3)  =  94.50
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     14.989(CFS)
Total initial stream area =        6.500(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      106.000 to Point/Station      104.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1519.000(Ft.)
End of natural channel elevation =   1514.000(Ft.)
Length of natural channel  =   634.000(Ft.)
Estimated mean flow rate at midpoint of channel =     36.112(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
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Velocity using mean channel flow =   3.13(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0079
Corrected/adjusted channel slope =  0.0079
Travel time =    3.37 min.     TC =   19.16  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.864
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  93.10
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.380(In/Hr) for a   100.0 year storm
Subarea runoff =     37.683(CFS) for     18.320(Ac.)
Total runoff =     52.672(CFS)  Total area =      24.820(Ac.)


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Process from Point/Station      106.000 to Point/Station      104.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     24.820(Ac.)
Runoff from this stream =     52.672(CFS)
Time of concentration =   19.16 min.
Rainfall intensity =     2.380(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1      289.840     17.56                2.494
2       52.672     19.16                2.380
Largest stream flow has longer or shorter time of concentration
Qp =    289.840 + sum of
         Qa          Tb/Ta
         52.672 *    0.916 =     48.252
Qp =    338.092

Total of 2 streams to confluence:
Flow rates before confluence point:
     289.840      52.672
Area of streams before confluence:
      123.370       24.820
Results of confluence:
Total flow rate =    338.092(CFS)
Time of concentration =    17.556 min.
Effective stream area after confluence =    148.190(Ac.)


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Process from Point/Station      104.000 to Point/Station      107.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
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Top of natural channel elevation =   1514.000(Ft.)
End of natural channel elevation =   1504.000(Ft.)
Length of natural channel  =   897.000(Ft.)
Estimated mean flow rate at midpoint of channel =    366.656(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   7.49(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0111
Corrected/adjusted channel slope =  0.0111
Travel time =    2.00 min.     TC =   19.55  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.864
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.300
RI index for soil(AMC 3)  =  93.22
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.355(In/Hr) for a   100.0 year storm
Subarea runoff =     50.978(CFS) for     25.040(Ac.)
Total runoff =    389.070(CFS)  Total area =     173.230(Ac.)
End of computations, total study area =          173.23 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  83.7
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- Area 'A' – 2 Year Post-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
       Rational Hydrology Study        Date: 11/08/21  File:PR002.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
DEVELOPED CONDITION RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

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Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.550(In/Hr)
Slope of intensity duration curve = 0.5300




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Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   448.000(Ft.)
Top (of initial area) elevation =  1800.000(Ft.)
Bottom (of initial area) elevation =  1660.000(Ft.)
Difference in elevation =   140.000(Ft.)
Slope =    0.31250  s(percent)=      31.25
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.688 min.
Rainfall intensity =      1.634(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.588
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.152(CFS)
Total initial stream area =        3.280(Ac.)
Pervious area fraction = 1.000
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Process from Point/Station      101.000 to Point/Station      102.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of natural channel elevation =   1660.000(Ft.)
End of natural channel elevation =   1565.300(Ft.)
Length of natural channel  =   618.000(Ft.)
Estimated mean flow rate at midpoint of channel =      7.534(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   8.61(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.1532
Corrected/adjusted channel slope =  0.1366
Travel time =    1.20 min.     TC =    8.88  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.572
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.514(In/Hr) for a     2.0 year storm
Subarea runoff =      7.899(CFS) for      9.120(Ac.)
Total runoff =     11.051(CFS)   Total area =      12.400(Ac.)


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Process from Point/Station      102.000 to Point/Station      102.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1565.300(Ft.)
Downstream point/station elevation =  1563.000(Ft.)
Pipe length  =   123.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.051(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.051(CFS)
Normal flow depth in pipe =   11.84(In.)
Flow top width inside pipe =   17.08(In.)
Critical Depth =   15.27(In.)
Pipe flow velocity =      8.96(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =     9.11 min.


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Process from Point/Station      102.100 to Point/Station      102.100
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.624
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
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Pervious area fraction =  0.500; Impervious fraction =  0.500
Time of concentration =     9.11 min.
Rainfall intensity =      1.493(In/Hr) for a     2.0 year storm
Subarea runoff =      0.960(CFS) for      1.030(Ac.)
Total runoff =     12.011(CFS)    Total area =      13.430(Ac.)


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Process from Point/Station      102.100 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1563.000(Ft.)
Downstream point/station elevation =  1549.000(Ft.)
Pipe length  =   671.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.011(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    12.011(CFS)
Normal flow depth in pipe =   12.09(In.)
Flow top width inside pipe =   16.90(In.)
Critical Depth =   15.76(In.)
Pipe flow velocity =      9.52(Ft/s)
Travel time through pipe =    1.17 min.
Time of concentration (TC) =    10.29 min.


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Process from Point/Station      102.100 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.430(Ac.)
Runoff from this stream =     12.011(CFS)
Time of concentration =   10.29 min.
Rainfall intensity =     1.400(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       12.011     10.29                1.400
Largest stream flow has longer time of concentration
Qp =     12.011 + sum of
Qp =     12.011

Total of 1 streams to confluence:
Flow rates before confluence point:
      12.011
Area of streams before confluence:
       13.430
Results of confluence:
Total flow rate =     12.011(CFS)
Time of concentration =    10.288 min.
Effective stream area after confluence =     13.430(Ac.)


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Process from Point/Station      104.000 to Point/Station      105.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   425.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1556.200(Ft.)
Difference in elevation =    15.800(Ft.)
Slope =    0.03718  s(percent)=       3.72
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```
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.479 min.
Rainfall intensity =      1.551(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.628
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.926(CFS)
Total initial stream area =        0.950(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      105.000 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1549.200(Ft.)
Downstream point/station elevation =  1549.000(Ft.)
Pipe length  =    15.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.926(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.926(CFS)
Normal flow depth in pipe =    4.42(In.)
Flow top width inside pipe =    9.00(In.)
Critical Depth =    5.29(In.)
Pipe flow velocity =      4.29(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =     8.54 min.


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Process from Point/Station      105.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.950(Ac.)
Runoff from this stream =      0.926(CFS)
Time of concentration =    8.54 min.
Rainfall intensity =     1.546(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       12.011     10.29                1.400
2        0.926      8.54                1.546
Largest stream flow has longer time of concentration
Qp =     12.011 + sum of
         Qb         Ia/Ib
          0.926 *    0.906 =      0.839
Qp =     12.849

Total of 2 streams to confluence:
Flow rates before confluence point:
      12.011       0.926
Area of streams before confluence:
       13.430        0.950
Results of confluence:
Total flow rate =     12.849(CFS)
Time of concentration =    10.288 min.
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Effective stream area after confluence =     14.380(Ac.)


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Process from Point/Station      103.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1549.000(Ft.)
Downstream point/station elevation =  1548.700(Ft.)
Pipe length  =    29.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.849(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    12.849(CFS)
Normal flow depth in pipe =   14.18(In.)
Flow top width inside pipe =   19.67(In.)
Critical Depth =   16.03(In.)
Pipe flow velocity =      7.44(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    10.35 min.


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Process from Point/Station      103.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     14.380(Ac.)
Runoff from this stream =     12.849(CFS)
Time of concentration =   10.35 min.
Rainfall intensity =     1.396(In/Hr)


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Process from Point/Station      104.000 to Point/Station      107.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   553.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1564.600(Ft.)
Difference in elevation =     7.400(Ft.)
Slope =    0.01338  s(percent)=       1.34
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.557 min.
Rainfall intensity =      1.317(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.611
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.949(CFS)
Total initial stream area =        1.180(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      107.000 to Point/Station      108.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------
Top of street segment elevation =  1564.600(Ft.)
End of street segment elevation =  1556.200(Ft.)
Length of street segment  =   684.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
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Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      1.553(CFS)
Depth of flow =   0.269(Ft.), Average velocity =   2.459(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   7.105(Ft.)
Flow velocity =   2.46(Ft/s)
Travel time =    4.64 min.     TC =   16.19  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.612
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.050
Decimal fraction soil group D = 0.200
RI index for soil(AMC 1)  =  40.45
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.101(In/Hr) for a     2.0 year storm
Subarea runoff =      1.152(CFS) for      1.710(Ac.)
Total runoff =      2.101(CFS)   Total area =       2.890(Ac.)
Street flow at end of street =      2.101(CFS)
Half street flow at end of street =      2.101(CFS)
Depth of flow =   0.291(Ft.), Average velocity =   2.621(Ft/s)
Flow width (from curb towards crown)=   8.214(Ft.)


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Process from Point/Station      108.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1549.200(Ft.)
Downstream point/station elevation =  1548.700(Ft.)
Pipe length  =    42.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.101(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.101(CFS)
Normal flow depth in pipe =    6.28(In.)
Flow top width inside pipe =   11.99(In.)
Critical Depth =    7.43(In.)
Pipe flow velocity =      5.04(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =    16.33 min.


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Process from Point/Station      108.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.890(Ac.)
Runoff from this stream =      2.101(CFS)
Time of concentration =   16.33 min.
Rainfall intensity =     1.096(In/Hr)
Summary of stream data:
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```
Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       12.849     10.35                 1.396
2        2.101     16.33                 1.096
Largest stream flow has longer or shorter time of concentration
Qp =     12.849 + sum of
         Qa          Tb/Ta
          2.101 *    0.634 =      1.332
Qp =     14.181

Total of 2 streams to confluence:
Flow rates before confluence point:
      12.849       2.101
Area of streams before confluence:
       14.380        2.890
Results of confluence:
Total flow rate =     14.181(CFS)
Time of concentration =    10.353 min.
Effective stream area after confluence =     17.270(Ac.)


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Process from Point/Station      106.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1548.700(Ft.)
Downstream point/station elevation =  1523.000(Ft.)
Pipe length  =   620.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.181(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    14.181(CFS)
Normal flow depth in pipe =   10.71(In.)
Flow top width inside pipe =   17.67(In.)
Critical Depth =   16.64(In.)
Pipe flow velocity =     12.94(Ft/s)
Travel time through pipe =    0.80 min.
Time of concentration (TC) =    11.15 min.


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Process from Point/Station      106.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     17.270(Ac.)
Runoff from this stream =     14.181(CFS)
Time of concentration =   11.15 min.
Rainfall intensity =     1.342(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      111.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   530.000(Ft.)
Top (of initial area) elevation =  1540.000(Ft.)
Bottom (of initial area) elevation =  1530.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01887  s(percent)=       1.89
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.312 min.
Rainfall intensity =      1.003(In/Hr) for a     2.0 year storm
UNDEVELOPED (fair cover) subarea
```

```
Runoff Coefficient = 0.529
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.150
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.850
RI index for soil(AMC 1)  =  65.45
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.560(CFS)
Total initial stream area =        2.940(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      111.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1523.400(Ft.)
Downstream point/station elevation =  1523.000(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.560(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.560(CFS)
Normal flow depth in pipe =    6.95(In.)
Flow top width inside pipe =    7.55(In.)
Critical Depth =    6.90(In.)
Pipe flow velocity =      4.26(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    19.47 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      111.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.940(Ac.)
Runoff from this stream =      1.560(CFS)
Time of concentration =   19.47 min.
Rainfall intensity =     0.999(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       14.181     11.15                1.342
2        1.560     19.47                0.999
Largest stream flow has longer or shorter time of concentration
Qp =     14.181 + sum of
         Qa          Tb/Ta
          1.560 *    0.573 =      0.893
Qp =     15.074

Total of 2 streams to confluence:
Flow rates before confluence point:
      14.181       1.560
Area of streams before confluence:
       17.270        2.940
Results of confluence:
Total flow rate =     15.074(CFS)
Time of concentration =    11.151 min.
Effective stream area after confluence =     20.210(Ac.)


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Process from Point/Station      109.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1523.000(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.074(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    15.074(CFS)
Normal flow depth in pipe =   11.91(In.)
Flow top width inside pipe =   12.14(In.)
Critical depth could not be calculated.
Pipe flow velocity =     14.43(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    11.20 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     20.210(Ac.)
Runoff from this stream =     15.074(CFS)
Time of concentration =   11.20 min.
Rainfall intensity =     1.339(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      113.000 to Point/Station      114.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   965.000(Ft.)
Top (of initial area) elevation =  1567.900(Ft.)
Bottom (of initial area) elevation =  1556.000(Ft.)
Difference in elevation =    11.900(Ft.)
Slope =    0.01233  s(percent)=       1.23
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.678 min.
Rainfall intensity =      1.160(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.650
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.400
RI index for soil(AMC 1)  =  48.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.135(CFS)
Total initial stream area =        2.830(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      115.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of street segment elevation =  1556.000(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   610.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
```

```
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.847(CFS)
Depth of flow =   0.267(Ft.), Average velocity =   4.581(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   7.035(Ft.)
Flow velocity =   4.58(Ft/s)
Travel time =    2.22 min.     TC =   16.90  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.615
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  41.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.077(In/Hr) for a     2.0 year storm
Subarea runoff =      1.330(CFS) for      2.010(Ac.)
Total runoff =      3.465(CFS)   Total area =       4.840(Ac.)
Street flow at end of street =      3.465(CFS)
Half street flow at end of street =      3.465(CFS)
Depth of flow =   0.282(Ft.), Average velocity =   4.772(Ft/s)
Flow width (from curb towards crown)=   7.743(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1521.200(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.465(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.465(CFS)
Normal flow depth in pipe =    8.44(In.)
Flow top width inside pipe =   10.97(In.)
Critical Depth =    9.55(In.)
Pipe flow velocity =      5.87(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    16.98 min.


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Process from Point/Station      115.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.840(Ac.)
Runoff from this stream =      3.465(CFS)
Time of concentration =   16.98 min.
Rainfall intensity =     1.074(In/Hr)


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Process from Point/Station      104.000 to Point/Station      127.000
**** INITIAL AREA EVALUATION ****
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Initial area flow distance =   623.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1552.000(Ft.)
Difference in elevation =    20.000(Ft.)
Slope =    0.03210  s(percent)=       3.21
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.175 min.
Rainfall intensity =      1.409(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.618
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.549(CFS)
Total initial stream area =        1.780(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      127.000 to Point/Station      128.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1552.000(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   518.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.352(CFS)
Depth of flow =   0.254(Ft.), Average velocity =   4.407(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   6.381(Ft.)
Flow velocity =   4.41(Ft/s)
Travel time =    1.96 min.     TC =   12.13  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.633
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  41.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.283(In/Hr) for a     2.0 year storm
Subarea runoff =      1.552(CFS) for      1.910(Ac.)
Total runoff =      3.101(CFS)   Total area =       3.690(Ac.)
Street flow at end of street =      3.101(CFS)
Half street flow at end of street =      3.101(CFS)
Depth of flow =   0.274(Ft.), Average velocity =   4.658(Ft/s)
Flow width (from curb towards crown)=   7.343(Ft.)
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Process from Point/Station      128.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1521.200(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    45.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.101(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.101(CFS)
Normal flow depth in pipe =    9.09(In.)
Flow top width inside pipe =   10.28(In.)
Critical Depth =    9.06(In.)
Pipe flow velocity =      4.85(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    12.29 min.


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Process from Point/Station      128.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      3.690(Ac.)
Runoff from this stream =      3.101(CFS)
Time of concentration =   12.29 min.
Rainfall intensity =     1.274(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       15.074     11.20                 1.339
2        3.465     16.98                 1.074
3        3.101     12.29                 1.274
Largest stream flow has longer or shorter time of concentration
Qp =     15.074 + sum of
         Qa          Tb/Ta
          3.465 *    0.659 =      2.284
         Qa          Tb/Ta
          3.101 *    0.911 =      2.825
Qp =     20.184

Total of 3 streams to confluence:
Flow rates before confluence point:
      15.074       3.465       3.101
Area of streams before confluence:
       20.210        4.840        3.690
Results of confluence:
Total flow rate =     20.184(CFS)
Time of concentration =    11.195 min.
Effective stream area after confluence =     28.740(Ac.)


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Process from Point/Station      112.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1520.800(Ft.)
Downstream point/station elevation =  1520.000(Ft.)
Pipe length  =    32.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.184(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    20.184(CFS)
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Normal flow depth in pipe =   14.27(In.)
Flow top width inside pipe =   19.60(In.)
Critical Depth =   19.24(In.)
Pipe flow velocity =     11.59(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    11.24 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      112.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     28.740(Ac.)
Runoff from this stream =     20.184(CFS)
Time of concentration =   11.24 min.
Rainfall intensity =     1.336(In/Hr)


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Process from Point/Station      117.000 to Point/Station      118.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   500.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1539.300(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.00900  s(percent)=       0.90
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.017 min.
Rainfall intensity =      1.290(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.651
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.748(CFS)
Total initial stream area =        0.890(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      118.000 to Point/Station      119.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1539.300(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   933.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      1.339(CFS)
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Depth of flow =   0.265(Ft.), Average velocity =   2.215(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   6.914(Ft.)
Flow velocity =   2.21(Ft/s)
Travel time =    7.02 min.     TC =   19.04  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.645
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.700
RI index for soil(AMC 1)  =  50.16
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.011(In/Hr) for a     2.0 year storm
Subarea runoff =      1.101(CFS) for      1.690(Ac.)
Total runoff =      1.849(CFS)   Total area =       2.580(Ac.)
Street flow at end of street =      1.849(CFS)
Half street flow at end of street =      1.849(CFS)
Depth of flow =   0.288(Ft.), Average velocity =   2.369(Ft/s)
Flow width (from curb towards crown)=   8.085(Ft.)


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Process from Point/Station      119.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  1521.400(Ft.)
Downstream point/station elevation =  1520.000(Ft.)
Pipe length  =    57.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.849(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.849(CFS)
Normal flow depth in pipe =    5.62(In.)
Flow top width inside pipe =    8.72(In.)
Critical Depth =    7.46(In.)
Pipe flow velocity =      6.38(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    19.19 min.


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Process from Point/Station      119.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.580(Ac.)
Runoff from this stream =      1.849(CFS)
Time of concentration =   19.19 min.
Rainfall intensity =     1.006(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       20.184     11.24                 1.336
2        1.849     19.19                 1.006
Largest stream flow has longer or shorter time of concentration
Qp =     20.184 + sum of
         Qa          Tb/Ta
          1.849 *    0.586 =      1.083
Qp =     21.267

Total of 2 streams to confluence:
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```
Flow rates before confluence point:
      20.184       1.849
Area of streams before confluence:
       28.740        2.580
Results of confluence:
Total flow rate =     21.267(CFS)
Time of concentration =    11.241 min.
Effective stream area after confluence =     31.320(Ac.)


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Process from Point/Station      116.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1520.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    21.267(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    21.267(CFS)
Normal flow depth in pipe =   19.17(In.)
Flow top width inside pipe =   19.24(In.)
Critical Depth =   19.82(In.)
Pipe flow velocity =      7.90(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =    11.36 min.


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Process from Point/Station      116.000 to Point/Station      120.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     31.320(Ac.)
Runoff from this stream =     21.267(CFS)
Time of concentration =   11.36 min.
Rainfall intensity =     1.329(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      121.000 to Point/Station      122.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   193.000(Ft.)
Top (of initial area) elevation =  1546.000(Ft.)
Bottom (of initial area) elevation =  1544.700(Ft.)
Difference in elevation =     1.300(Ft.)
Slope =    0.00674  s(percent)=       0.67
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.702 min.
Rainfall intensity =      1.530(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.722
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.071(CFS)
Total initial stream area =        0.970(Ac.)
Pervious area fraction = 0.500
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Process from Point/Station      122.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1537.700(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =   496.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.071(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.071(CFS)
Normal flow depth in pipe =    4.96(In.)
Flow top width inside pipe =    8.95(In.)
Critical Depth =    5.70(In.)
Pipe flow velocity =      4.28(Ft/s)
Travel time through pipe =    1.93 min.
Time of concentration (TC) =    10.63 min.


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Process from Point/Station      122.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.970(Ac.)
Runoff from this stream =      1.071(CFS)
Time of concentration =   10.63 min.
Rainfall intensity =     1.376(In/Hr)


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Process from Point/Station      124.000 to Point/Station      125.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   960.000(Ft.)
Top (of initial area) elevation =  1549.500(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =    10.500(Ft.)
Slope =    0.01094  s(percent)=       1.09
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.003 min.
Rainfall intensity =      1.147(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.649
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.600
RI index for soil(AMC 1)  =  47.88
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.413(CFS)
Total initial stream area =        4.590(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      125.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =    26.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.413(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.413(CFS)
```

```
Normal flow depth in pipe =    8.84(In.)
Flow top width inside pipe =   10.57(In.)
Critical Depth =    9.48(In.)
Pipe flow velocity =      5.51(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    15.08 min.


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Process from Point/Station      125.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      4.590(Ac.)
Runoff from this stream =      3.413(CFS)
Time of concentration =   15.08 min.
Rainfall intensity =     1.143(In/Hr)


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Process from Point/Station      124.000 to Point/Station      126.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1549.500(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =    10.500(Ft.)
Slope =    0.01050  s(percent)=       1.05
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.375 min.
Rainfall intensity =      1.132(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.657
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.700
RI index for soil(AMC 1)  =  50.16
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.720(CFS)
Total initial stream area =        5.000(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      126.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.720(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.720(CFS)
Normal flow depth in pipe =    8.52(In.)
Flow top width inside pipe =   10.89(In.)
Critical Depth =    9.85(In.)
Pipe flow velocity =      6.24(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    15.43 min.


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Process from Point/Station      126.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
```

```
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      5.000(Ac.)
Runoff from this stream =      3.720(CFS)
Time of concentration =   15.43 min.
Rainfall intensity =     1.130(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        1.071     10.63                1.376
2        3.413     15.08                1.143
3        3.720     15.43                1.130
Largest stream flow has longer time of concentration
Qp =      3.720 + sum of
         Qb         Ia/Ib
          1.071 *    0.821 =      0.879
         Qb         Ia/Ib
          3.413 *    0.988 =      3.373
Qp =      7.971

Total of 3 streams to confluence:
Flow rates before confluence point:
       1.071       3.413       3.720
Area of streams before confluence:
        0.970        4.590        5.000
Results of confluence:
Total flow rate =      7.971(CFS)
Time of concentration =    15.429 min.
Effective stream area after confluence =     10.560(Ac.)


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Process from Point/Station      123.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1531.700(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =   800.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.971(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     7.971(CFS)
Normal flow depth in pipe =   15.00(In.)
Flow top width inside pipe =    0.00(In.)
Critical Depth =   13.37(In.)
Pipe flow velocity =      6.50(Ft/s)
Travel time through pipe =    2.05 min.
Time of concentration (TC) =    17.48 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station      120.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     10.560(Ac.)
Runoff from this stream =      7.971(CFS)
Time of concentration =   17.48 min.
Rainfall intensity =     1.057(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
```

```
 No.       (CFS)       (min)                (In/Hr)


1       21.267     11.36            1.329
2        7.971     17.48            1.057
Largest stream flow has longer or shorter time of concentration
Qp =     21.267 + sum of
         Qa          Tb/Ta
          7.971 *    0.650 =      5.178
Qp =     26.445

Total of 2 main streams to confluence:
Flow rates before confluence point:
      21.267       7.971
Area of streams before confluence:
       31.320       10.560


Results of confluence:
Total flow rate =     26.445(CFS)
Time of concentration =    11.355 min.
Effective stream area after confluence  =     41.880(Ac.)


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Process from Point/Station      120.000 to Point/Station      128.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1519.500(Ft.)
Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =  1360.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    26.445(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    26.445(CFS)
Normal flow depth in pipe =   21.47(In.)
Flow top width inside pipe =   21.79(In.)
Critical Depth =   21.54(In.)
Pipe flow velocity =      7.80(Ft/s)
Travel time through pipe =    2.91 min.
Time of concentration (TC) =    14.26 min.


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Process from Point/Station      120.000 to Point/Station      128.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     41.880(Ac.)
Runoff from this stream =     26.445(CFS)
Time of concentration =   14.26 min.
Rainfall intensity =     1.178(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      158.000 to Point/Station      159.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   245.000(Ft.)
Top (of initial area) elevation =  1720.000(Ft.)
Bottom (of initial area) elevation =  1659.000(Ft.)
Difference in elevation =    61.000(Ft.)
Slope =    0.24898  s(percent)=      24.90
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
```

```
Initial area time of concentration =    6.320 min.
Rainfall intensity =      1.813(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.609
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.225(CFS)
Total initial stream area =        1.110(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      158.000 to Point/Station      159.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     6.32 min.
Rainfall intensity =      1.813(In/Hr) for a     2.0 year storm
Subarea runoff =      0.631(CFS) for      0.410(Ac.)
Total runoff =      1.856(CFS)   Total area =       1.520(Ac.)


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Process from Point/Station      158.000 to Point/Station      159.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     6.32 min.
Rainfall intensity =      1.813(In/Hr) for a     2.0 year storm
Subarea runoff =      1.093(CFS) for      0.710(Ac.)
Total runoff =      2.949(CFS)   Total area =       2.230(Ac.)


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Process from Point/Station      160.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1650.000(Ft.)
Downstream point/station elevation =  1512.000(Ft.)
Pipe length  =   965.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.949(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.949(CFS)
Normal flow depth in pipe =    4.35(In.)
Flow top width inside pipe =    8.99(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.95(Ft/s)
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Travel time through pipe =    1.15 min.
Time of concentration (TC) =     7.47 min.


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Process from Point/Station      160.000 to Point/Station      161.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      2.230(Ac.)
Runoff from this stream =      2.949(CFS)
Time of concentration =    7.47 min.
Rainfall intensity =     1.659(In/Hr)


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Process from Point/Station      162.000 to Point/Station      163.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   945.000(Ft.)
Top (of initial area) elevation =  1717.700(Ft.)
Bottom (of initial area) elevation =  1520.000(Ft.)
Difference in elevation =   197.700(Ft.)
Slope =    0.20921  s(percent)=      20.92
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.229 min.
Rainfall intensity =      1.337(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.573
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  63.56
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.552(CFS)
Total initial stream area =        4.640(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      163.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1513.000(Ft.)
Downstream point/station elevation =  1512.000(Ft.)
Pipe length  =    23.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.552(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.552(CFS)
Normal flow depth in pipe =    5.85(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =    9.66(In.)
Pipe flow velocity =      9.35(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    11.27 min.


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Process from Point/Station      163.000 to Point/Station      161.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      4.640(Ac.)
Runoff from this stream =      3.552(CFS)
```

```
Time of concentration =   11.27 min.
Rainfall intensity =     1.334(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        2.949      7.47                 1.659
2        3.552     11.27                 1.334
Largest stream flow has longer time of concentration
Qp =      3.552 + sum of
         Qb         Ia/Ib
          2.949 *    0.804 =      2.372
Qp =      5.924

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.949       3.552
Area of streams before confluence:
        2.230        4.640
Results of confluence:
Total flow rate =      5.924(CFS)
Time of concentration =    11.270 min.
Effective stream area after confluence =      6.870(Ac.)


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Process from Point/Station      163.000 to Point/Station      161.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.556
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  61.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    11.27 min.
Rainfall intensity =      1.334(In/Hr) for a     2.0 year storm
Subarea runoff =      0.445(CFS) for      0.600(Ac.)
Total runoff =      6.370(CFS)   Total area =       7.470(Ac.)


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Process from Point/Station      161.000 to Point/Station      128.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1512.000(Ft.)
Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =   567.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.370(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     6.370(CFS)
Normal flow depth in pipe =   12.56(In.)
Flow top width inside pipe =   16.53(In.)
Critical Depth =   11.71(In.)
Pipe flow velocity =      4.84(Ft/s)
Travel time through pipe =    1.95 min.
Time of concentration (TC) =    13.22 min.


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Process from Point/Station      161.000 to Point/Station      128.000
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**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      7.470(Ac.)
Runoff from this stream =      6.370(CFS)
Time of concentration =   13.22 min.
Rainfall intensity =     1.226(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       26.445     14.26           1.178
2        6.370     13.22           1.226
Largest stream flow has longer time of concentration
Qp =     26.445 + sum of
         Qb         Ia/Ib
          6.370 *    0.961 =      6.119
Qp =     32.565

Total of 2 main streams to confluence:
Flow rates before confluence point:
      26.445       6.370
Area of streams before confluence:
       41.880        7.470


Results of confluence:
Total flow rate =     32.565(CFS)
Time of concentration =    14.262 min.
Effective stream area after confluence  =     49.350(Ac.)


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Process from Point/Station      128.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1509.000(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =   333.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    32.565(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    32.565(CFS)
Normal flow depth in pipe =   16.76(In.)
Flow top width inside pipe =   22.03(In.)
Critical Depth =   22.74(In.)
Pipe flow velocity =     13.90(Ft/s)
Travel time through pipe =    0.40 min.
Time of concentration (TC) =    14.66 min.


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Process from Point/Station      128.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
_____________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     49.350(Ac.)
Runoff from this stream =     32.565(CFS)
Time of concentration =   14.66 min.
Rainfall intensity =     1.161(In/Hr)


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Process from Point/Station      130.000 to Point/Station      131.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   994.000(Ft.)
Top (of initial area) elevation =  1521.000(Ft.)
Bottom (of initial area) elevation =  1508.600(Ft.)
Difference in elevation =    12.400(Ft.)
Slope =    0.01247  s(percent)=       1.25
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.819 min.
Rainfall intensity =      1.154(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.622
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  41.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.680(CFS)
Total initial stream area =        2.340(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      131.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1499.400(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =    22.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.680(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.680(CFS)
Normal flow depth in pipe =    6.49(In.)
Flow top width inside pipe =    8.07(In.)
Critical Depth =    7.14(In.)
Pipe flow velocity =      4.93(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    14.89 min.


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Process from Point/Station      131.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.340(Ac.)
Runoff from this stream =      1.680(CFS)
Time of concentration =   14.89 min.
Rainfall intensity =     1.151(In/Hr)


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Process from Point/Station      132.000 to Point/Station      133.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   636.000(Ft.)
Top (of initial area) elevation =  1526.500(Ft.)
Bottom (of initial area) elevation =  1519.100(Ft.)
Difference in elevation =     7.400(Ft.)
Slope =    0.01164  s(percent)=       1.16
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.569 min.
Rainfall intensity =      1.259(In/Hr) for a     2.0 year storm
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SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.700
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.199(CFS)
Total initial stream area =        1.360(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      133.000 to Point/Station      134.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1519.100(Ft.)
End of street segment elevation =  1510.100(Ft.)
Length of street segment  =   806.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      3.498(CFS)
Depth of flow =   0.337(Ft.), Average velocity =   2.833(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  10.527(Ft.)
Flow velocity =   2.83(Ft/s)
Travel time =    4.74 min.     TC =   17.31  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.630
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.063(In/Hr) for a     2.0 year storm
Subarea runoff =      4.501(CFS) for      6.720(Ac.)
Total runoff =      5.701(CFS)   Total area =       8.080(Ac.)
Street flow at end of street =      5.701(CFS)
Half street flow at end of street =      5.701(CFS)
Depth of flow =   0.385(Ft.), Average velocity =   3.176(Ft/s)
Flow width (from curb towards crown)=  12.915(Ft.)


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Process from Point/Station      134.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1499.400(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.701(CFS)
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Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.701(CFS)
Normal flow depth in pipe =   10.20(In.)
Flow top width inside pipe =   14.00(In.)
Critical Depth =   11.60(In.)
Pipe flow velocity =      6.41(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    17.38 min.


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Process from Point/Station      134.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      8.080(Ac.)
Runoff from this stream =      5.701(CFS)
Time of concentration =   17.38 min.
Rainfall intensity =     1.061(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       32.565     14.66                1.161
2        1.680     14.89                1.151
3        5.701     17.38                1.061
Largest stream flow has longer or shorter time of concentration
Qp =     32.565 + sum of
         Qa          Tb/Ta
          1.680 *    0.984 =      1.654
         Qa          Tb/Ta
          5.701 *    0.844 =      4.810
Qp =     39.029

Total of 3 streams to confluence:
Flow rates before confluence point:
      32.565       1.680       5.701
Area of streams before confluence:
       49.350        2.340        8.080
Results of confluence:
Total flow rate =     39.029(CFS)
Time of concentration =    14.661 min.
Effective stream area after confluence =     59.770(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      129.000 to Point/Station      135.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1499.100(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =   107.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    39.029(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    39.029(CFS)
Normal flow depth in pipe =   23.06(In.)
Flow top width inside pipe =   25.30(In.)
Critical Depth =   25.29(In.)
Pipe flow velocity =      9.63(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    14.85 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      129.000 to Point/Station      135.100
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     59.770(Ac.)
Runoff from this stream =     39.029(CFS)
Time of concentration =   14.85 min.
Rainfall intensity =     1.153(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      136.000 to Point/Station      137.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   616.000(Ft.)
Top (of initial area) elevation =  1515.100(Ft.)
Bottom (of initial area) elevation =  1506.700(Ft.)
Difference in elevation =     8.400(Ft.)
Slope =    0.01364  s(percent)=       1.36
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.021 min.
Rainfall intensity =      1.289(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.521
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  16.20
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.202(CFS)
Total initial stream area =        1.790(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      137.000 to Point/Station      138.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.900(Ft.)
Downstream point/station elevation =  1498.400(Ft.)
Pipe length  =    47.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.202(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.202(CFS)
Normal flow depth in pipe =    5.57(In.)
Flow top width inside pipe =    8.74(In.)
Critical Depth =    6.05(In.)
Pipe flow velocity =      4.18(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    12.21 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      137.000 to Point/Station      138.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      1.790(Ac.)
Runoff from this stream =      1.202(CFS)
Time of concentration =   12.21 min.
Rainfall intensity =     1.279(In/Hr)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      139.000 to Point/Station      140.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   701.000(Ft.)
Top (of initial area) elevation =  1512.200(Ft.)
Bottom (of initial area) elevation =  1506.700(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.00785  s(percent)=       0.78
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.139 min.
Rainfall intensity =      1.183(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.600
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.675(CFS)
Total initial stream area =        2.360(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      140.000 to Point/Station      138.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1498.600(Ft.)
Downstream point/station elevation =  1498.400(Ft.)
Pipe length  =    10.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.675(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.675(CFS)
Normal flow depth in pipe =    5.63(In.)
Flow top width inside pipe =    8.71(In.)
Critical Depth =    7.14(In.)
Pipe flow velocity =      5.76(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    14.17 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      140.000 to Point/Station      138.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      2.360(Ac.)
Runoff from this stream =      1.675(CFS)
Time of concentration =   14.17 min.
Rainfall intensity =     1.182(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        1.202     12.21                1.279
2        1.675     14.17                1.182
Largest stream flow has longer time of concentration
Qp =      1.675 + sum of
         Qb         Ia/Ib
```

```
          1.202 *    0.924 =      1.111
Qp =      2.786

Total of 2 streams to confluence:
Flow rates before confluence point:
       1.202       1.675
Area of streams before confluence:
        1.790        2.360
Results of confluence:
Total flow rate =      2.786(CFS)
Time of concentration =    14.168 min.
Effective stream area after confluence =      4.150(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      138.000 to Point/Station      135.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.400(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.786(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.786(CFS)
Normal flow depth in pipe =    7.98(In.)
Flow top width inside pipe =   11.33(In.)
Critical Depth =    8.59(In.)
Pipe flow velocity =      5.02(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =    14.30 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      138.000 to Point/Station      135.200
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      4.150(Ac.)
Runoff from this stream =      2.786(CFS)
Time of concentration =   14.30 min.
Rainfall intensity =     1.176(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      146.000 to Point/Station      147.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1744.000(Ft.)
Bottom (of initial area) elevation =  1579.000(Ft.)
Difference in elevation =   165.000(Ft.)
Slope =    0.16500  s(percent)=      16.50
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.044 min.
Rainfall intensity =      1.288(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.538
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
```

```
Initial subarea runoff =      2.959(CFS)
Total initial stream area =        4.270(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      147.000 to Point/Station      148.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =  1579.000(Ft.)
Downstream point elevation =  1568.000(Ft.)
Channel length thru subarea  =   185.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      3.196(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      3.196(CFS)
Depth of flow =   0.576(Ft.), Average velocity =   9.644(Ft/s)
Channel flow top width =    1.151(Ft.)
Flow Velocity =    9.64(Ft/s)
Travel time  =    0.32 min.
Time of concentration =   12.36 min.

Sub-Channel No. 1 Critical depth =      0.914(Ft.)
  '     '       '     Critical flow top width =      1.828(Ft.)
  '     '       '     Critical flow velocity=    3.826(Ft/s)
  '     '       '     Critical flow area =      0.836(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.437
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.270(In/Hr) for a     2.0 year storm
Subarea runoff =      0.422(CFS) for      0.760(Ac.)
Total runoff =      3.381(CFS)   Total area =       5.030(Ac.)
Depth of flow =   0.588(Ft.), Average velocity =   9.781(Ft/s)

Sub-Channel No. 1 Critical depth =      0.938(Ft.)
  '     '       '     Critical flow top width =      1.875(Ft.)
  '     '       '     Critical flow velocity=    3.847(Ft/s)
  '     '       '     Critical flow area =      0.879(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      147.000 to Point/Station      148.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.535
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    12.36 min.
Rainfall intensity =      1.270(In/Hr) for a     2.0 year storm
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Subarea runoff =      1.631(CFS) for      2.400(Ac.)
Total runoff =      5.012(CFS)   Total area =       7.430(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      148.000 to Point/Station      149.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =  1568.000(Ft.)
Downstream point elevation =  1560.000(Ft.)
Channel length thru subarea  =   220.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      5.147(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      5.147(CFS)
Depth of flow =   0.755(Ft.), Average velocity =   9.035(Ft/s)
Channel flow top width =    1.510(Ft.)
Flow Velocity =    9.04(Ft/s)
Travel time  =    0.41 min.
Time of concentration =   12.77 min.

Sub-Channel No. 1 Critical depth =      1.102(Ft.)
  '     '       '     Critical flow top width =      2.203(Ft.)
  '     '       '     Critical flow velocity=    4.242(Ft/s)
  '     '       '     Critical flow area =      1.213(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.433
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.249(In/Hr) for a     2.0 year storm
Subarea runoff =      0.217(CFS) for      0.400(Ac.)
Total runoff =      5.229(CFS)   Total area =       7.830(Ac.)
Depth of flow =   0.759(Ft.), Average velocity =   9.071(Ft/s)

Sub-Channel No. 1 Critical depth =      1.109(Ft.)
  '     '       '     Critical flow top width =      2.219(Ft.)
  '     '       '     Critical flow velocity=    4.249(Ft/s)
  '     '       '     Critical flow area =      1.231(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      149.000 to Point/Station      150.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =  1560.000(Ft.)
Downstream point elevation =  1555.000(Ft.)
Channel length thru subarea  =   190.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      5.531(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      5.531(CFS)
Depth of flow =   0.824(Ft.), Average velocity =   8.148(Ft/s)
```

```
Channel flow top width =    1.648(Ft.)
Flow Velocity =    8.15(Ft/s)
Travel time  =    0.39 min.
Time of concentration =   13.16 min.

Sub-Channel No. 1 Critical depth =      1.141(Ft.)
  '     '       '     Critical flow top width =      2.281(Ft.)
  '     '       '     Critical flow velocity=    4.251(Ft/s)
  '     '       '     Critical flow area =      1.301(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.430
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.229(In/Hr) for a     2.0 year storm
Subarea runoff =      0.534(CFS) for      1.010(Ac.)
Total runoff =      5.763(CFS)   Total area =       8.840(Ac.)
Depth of flow =   0.837(Ft.), Average velocity =   8.232(Ft/s)

Sub-Channel No. 1 Critical depth =      1.156(Ft.)
  '     '       '     Critical flow top width =      2.313(Ft.)
  '     '       '     Critical flow velocity=    4.310(Ft/s)
  '     '       '     Critical flow area =      1.337(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      149.000 to Point/Station      150.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.528
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    13.16 min.
Rainfall intensity =      1.229(In/Hr) for a     2.0 year storm
Subarea runoff =      2.206(CFS) for      3.400(Ac.)
Total runoff =      7.968(CFS)   Total area =      12.240(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      150.000 to Point/Station      151.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =  1555.000(Ft.)
Downstream point elevation =  1536.000(Ft.)
Channel length thru subarea  =   330.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      8.131(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      8.131(CFS)
Depth of flow =   0.822(Ft.), Average velocity =  12.034(Ft/s)
Channel flow top width =    1.644(Ft.)
```

```
Flow Velocity =   12.03(Ft/s)
Travel time  =    0.46 min.
Time of concentration =   13.62 min.

Sub-Channel No. 1 Critical depth =      1.328(Ft.)
  '     '       '     Critical flow top width =      2.656(Ft.)
  '     '       '     Critical flow velocity=    4.610(Ft/s)
  '     '       '     Critical flow area =      1.764(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.426
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.207(In/Hr) for a     2.0 year storm
Subarea runoff =      0.257(CFS) for      0.500(Ac.)
Total runoff =      8.225(CFS)   Total area =      12.740(Ac.)
Depth of flow =   0.826(Ft.), Average velocity =  12.069(Ft/s)

Sub-Channel No. 1 Critical depth =      1.328(Ft.)
  '     '       '     Critical flow top width =      2.656(Ft.)
  '     '       '     Critical flow velocity=    4.663(Ft/s)
  '     '       '     Critical flow area =      1.764(Sq.Ft)



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Process from Point/Station      151.000 to Point/Station      152.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1534.000(Ft.)
Downstream point/station elevation =  1533.000(Ft.)
Pipe length  =   104.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.225(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     8.225(CFS)
Normal flow depth in pipe =   12.16(In.)
Flow top width inside pipe =   16.85(In.)
Critical Depth =   13.33(In.)
Pipe flow velocity =      6.47(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    13.88 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      151.000 to Point/Station      152.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     12.740(Ac.)
Runoff from this stream =      8.225(CFS)
Time of concentration =   13.88 min.
Rainfall intensity =     1.195(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      153.000 to Point/Station      152.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   727.000(Ft.)
Top (of initial area) elevation =  1707.000(Ft.)
```

```
Bottom (of initial area) elevation =  1537.000(Ft.)
Difference in elevation =   170.000(Ft.)
Slope =    0.23384  s(percent)=      23.38
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.888 min.
Rainfall intensity =      1.430(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.625
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  67.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.037(CFS)
Total initial stream area =        3.400(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      153.000 to Point/Station      152.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      3.400(Ac.)
Runoff from this stream =      3.037(CFS)
Time of concentration =    9.89 min.
Rainfall intensity =     1.430(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        8.225     13.88                 1.195
2        3.037      9.89                 1.430
Largest stream flow has longer time of concentration
Qp =      8.225 + sum of
         Qb         Ia/Ib
          3.037 *    0.835 =      2.537
Qp =     10.763

Total of 2 streams to confluence:
Flow rates before confluence point:
       8.225       3.037
Area of streams before confluence:
       12.740        3.400
Results of confluence:
Total flow rate =     10.763(CFS)
Time of concentration =    13.883 min.
Effective stream area after confluence =     16.140(Ac.)


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Process from Point/Station      152.000 to Point/Station      154.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =   440.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.763(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    10.763(CFS)
Normal flow depth in pipe =   11.70(In.)
Flow top width inside pipe =   12.43(In.)
```

```
Critical depth could not be calculated.
Pipe flow velocity =     10.49(Ft/s)
Travel time through pipe =    0.70 min.
Time of concentration (TC) =    14.58 min.


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Process from Point/Station      152.000 to Point/Station      154.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     16.140(Ac.)
Runoff from this stream =     10.763(CFS)
Time of concentration =   14.58 min.
Rainfall intensity =     1.164(In/Hr)


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Process from Point/Station      155.000 to Point/Station      156.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   320.000(Ft.)
Top (of initial area) elevation =  1575.000(Ft.)
Bottom (of initial area) elevation =  1528.000(Ft.)
Difference in elevation =    47.000(Ft.)
Slope =    0.14688  s(percent)=      14.69
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.470 min.
Rainfall intensity =      1.387(In/Hr) for a     2.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.625
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  68.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.477(CFS)
Total initial stream area =        0.550(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      156.000 to Point/Station      154.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1528.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =    36.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.477(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.477(CFS)
Normal flow depth in pipe =    1.70(In.)
Flow top width inside pipe =    5.41(In.)
Critical Depth =    4.22(In.)
Pipe flow velocity =     10.44(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    10.53 min.


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Process from Point/Station      156.000 to Point/Station      154.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 2
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Stream flow area =      0.550(Ac.)
Runoff from this stream =      0.477(CFS)
Time of concentration =   10.53 min.
Rainfall intensity =     1.383(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       10.763     14.58                 1.164
2        0.477     10.53                 1.383
Largest stream flow has longer time of concentration
Qp =     10.763 + sum of
         Qb         Ia/Ib
          0.477 *    0.841 =      0.401
Qp =     11.164

Total of 2 streams to confluence:
Flow rates before confluence point:
      10.763       0.477
Area of streams before confluence:
       16.140        0.550
Results of confluence:
Total flow rate =     11.164(CFS)
Time of concentration =    14.582 min.
Effective stream area after confluence =     16.690(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      154.000 to Point/Station      157.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1519.500(Ft.)
Downstream point/station elevation =  1509.800(Ft.)
Pipe length  =   660.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.164(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.164(CFS)
Normal flow depth in pipe =   13.05(In.)
Flow top width inside pipe =   16.07(In.)
Critical Depth =   15.34(In.)
Pipe flow velocity =      8.13(Ft/s)
Travel time through pipe =    1.35 min.
Time of concentration (TC) =    15.94 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      154.000 to Point/Station      157.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     16.690(Ac.)
Runoff from this stream =     11.164(CFS)
Time of concentration =   15.94 min.
Rainfall intensity =     1.111(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      158.000 to Point/Station      159.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   442.000(Ft.)
Top (of initial area) elevation =  1640.000(Ft.)
Bottom (of initial area) elevation =  1535.000(Ft.)
```

```
Difference in elevation =   105.000(Ft.)
Slope =    0.23756  s(percent)=      23.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.078 min.
Rainfall intensity =      1.592(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.676
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  71.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      2.205(CFS)
Total initial stream area =        2.050(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      159.000 to Point/Station      157.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1509.800(Ft.)
Pipe length  =    65.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.205(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     2.205(CFS)
Normal flow depth in pipe =    3.55(In.)
Flow top width inside pipe =    5.90(In.)
Critical depth could not be calculated.
Pipe flow velocity =     18.22(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =     8.14 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      159.000 to Point/Station      157.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      2.050(Ac.)
Runoff from this stream =      2.205(CFS)
Time of concentration =    8.14 min.
Rainfall intensity =     1.586(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       11.164     15.94                1.111
2        2.205      8.14                1.586
Largest stream flow has longer time of concentration
Qp =     11.164 + sum of
         Qb         Ia/Ib
          2.205 *    0.700 =      1.544
Qp =     12.708

Total of 2 streams to confluence:
Flow rates before confluence point:
      11.164       2.205
Area of streams before confluence:
       16.690        2.050
Results of confluence:
```

```
Total flow rate =     12.708(CFS)
Time of concentration =    15.936 min.
Effective stream area after confluence =     18.740(Ac.)


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Process from Point/Station      157.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1509.800(Ft.)
Downstream point/station elevation =  1503.800(Ft.)
Pipe length  =   307.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.708(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    12.708(CFS)
Normal flow depth in pipe =   12.94(In.)
Flow top width inside pipe =   16.19(In.)
Critical Depth =   16.10(In.)
Pipe flow velocity =      9.35(Ft/s)
Travel time through pipe =    0.55 min.
Time of concentration (TC) =    16.48 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      157.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     18.740(Ac.)
Runoff from this stream =     12.708(CFS)
Time of concentration =   16.48 min.
Rainfall intensity =     1.091(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      161.000 to Point/Station      162.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   570.000(Ft.)
Top (of initial area) elevation =  1630.000(Ft.)
Bottom (of initial area) elevation =  1535.000(Ft.)
Difference in elevation =    95.000(Ft.)
Slope =    0.16667  s(percent)=      16.67
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.600 min.
Rainfall intensity =      1.453(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.628
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  67.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.514(CFS)
Total initial stream area =        1.660(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      162.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1503.800(Ft.)
```

```
Pipe length  =    72.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.514(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     1.514(CFS)
Normal flow depth in pipe =    2.73(In.)
Flow top width inside pipe =    5.97(In.)
Critical depth could not be calculated.
Pipe flow velocity =     17.45(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.67 min.


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Process from Point/Station      162.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      1.660(Ac.)
Runoff from this stream =      1.514(CFS)
Time of concentration =    9.67 min.
Rainfall intensity =     1.447(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       12.708     16.48                 1.091
2        1.514      9.67                 1.447
Largest stream flow has longer time of concentration
Qp =     12.708 + sum of
         Qb         Ia/Ib
          1.514 *    0.754 =      1.141
Qp =     13.849

Total of 2 streams to confluence:
Flow rates before confluence point:
      12.708       1.514
Area of streams before confluence:
       18.740        1.660
Results of confluence:
Total flow rate =     13.849(CFS)
Time of concentration =    16.483 min.
Effective stream area after confluence =     20.400(Ac.)


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Process from Point/Station      160.000 to Point/Station      135.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1503.800(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =   256.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.849(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    13.849(CFS)
Normal flow depth in pipe =   13.05(In.)
Flow top width inside pipe =   16.07(In.)
Critical Depth =   16.52(In.)
Pipe flow velocity =     10.09(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    16.91 min.


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Process from Point/Station      160.000 to Point/Station      135.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =     20.400(Ac.)
Runoff from this stream =     13.849(CFS)
Time of concentration =   16.91 min.
Rainfall intensity =     1.076(In/Hr)
Program is now starting with Main Stream No. 4


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Process from Point/Station      128.000 to Point/Station      140.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   580.000(Ft.)
Top (of initial area) elevation =  1529.800(Ft.)
Bottom (of initial area) elevation =  1523.300(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.01121  s(percent)=       1.12
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.205 min.
Rainfall intensity =      1.279(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.702
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.167(CFS)
Total initial stream area =        1.300(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      140.000 to Point/Station      141.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
____________________________________________________________________________
Top of street segment elevation =  1523.300(Ft.)
End of street segment elevation =  1504.000(Ft.)
Length of street segment  =  1420.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.142(CFS)
Depth of flow =   0.289(Ft.), Average velocity =   2.739(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   8.096(Ft.)
Flow velocity =   2.74(Ft/s)
Travel time =    8.64 min.     TC =   20.85  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
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```
Runoff Coefficient = 0.620
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      0.963(In/Hr) for a     2.0 year storm
Subarea runoff =      1.886(CFS) for      3.160(Ac.)
Total runoff =      3.053(CFS)   Total area =       4.460(Ac.)
Street flow at end of street =      3.053(CFS)
Half street flow at end of street =      3.053(CFS)
Depth of flow =   0.317(Ft.), Average velocity =   2.962(Ft/s)
Flow width (from curb towards crown)=   9.508(Ft.)


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Process from Point/Station      141.000 to Point/Station      142.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1498.800(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =    70.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.053(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.053(CFS)
Normal flow depth in pipe =    8.13(In.)
Flow top width inside pipe =   11.22(In.)
Critical Depth =    8.99(In.)
Pipe flow velocity =      5.39(Ft/s)
Travel time through pipe =    0.22 min.
Time of concentration (TC) =    21.06 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      141.000 to Point/Station      142.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 4 in normal stream number 1
Stream flow area =      4.460(Ac.)
Runoff from this stream =      3.053(CFS)
Time of concentration =   21.06 min.
Rainfall intensity =     0.958(In/Hr)


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Process from Point/Station      117.000 to Point/Station      143.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   722.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1537.300(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.00900  s(percent)=       0.90
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.919 min.
Rainfall intensity =      1.193(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.643
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
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Initial subarea runoff =      0.882(CFS)
Total initial stream area =        1.150(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      143.000 to Point/Station      144.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1537.300(Ft.)
End of street segment elevation =  1528.600(Ft.)
Length of street segment  =   863.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      1.344(CFS)
Depth of flow =   0.266(Ft.), Average velocity =   2.208(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   6.944(Ft.)
Flow velocity =   2.21(Ft/s)
Travel time =    6.52 min.     TC =   20.43  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.661
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.100
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.900
RI index for soil(AMC 1)  =  54.72
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      0.973(In/Hr) for a     2.0 year storm
Subarea runoff =      0.843(CFS) for      1.310(Ac.)
Total runoff =      1.725(CFS)   Total area =       2.460(Ac.)
Street flow at end of street =      1.725(CFS)
Half street flow at end of street =      1.725(CFS)
Depth of flow =   0.284(Ft.), Average velocity =   2.325(Ft/s)
Flow width (from curb towards crown)=   7.843(Ft.)


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Process from Point/Station      144.000 to Point/Station      145.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1528.600(Ft.)
End of street segment elevation =  1498.100(Ft.)
Length of street segment  =  1850.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
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```
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.438(CFS)
Depth of flow =   0.291(Ft.), Average velocity =   3.038(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   8.220(Ft.)
Flow velocity =   3.04(Ft/s)
Travel time =   10.15 min.     TC =   30.58  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.599
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      0.786(In/Hr) for a     2.0 year storm
Subarea runoff =      1.342(CFS) for      2.850(Ac.)
Total runoff =      3.066(CFS)   Total area =       5.310(Ac.)
Street flow at end of street =      3.066(CFS)
Half street flow at end of street =      3.066(CFS)
Depth of flow =   0.309(Ft.), Average velocity =   3.196(Ft/s)
Flow width (from curb towards crown)=   9.126(Ft.)


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Process from Point/Station      145.000 to Point/Station      142.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.600(Ft.)
Downstream point/station elevation =  1498.100(Ft.)
Pipe length  =    50.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.066(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.066(CFS)
Normal flow depth in pipe =    8.58(In.)
Flow top width inside pipe =   10.84(In.)
Critical Depth =    9.01(In.)
Pipe flow velocity =      5.10(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    30.75 min.


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Process from Point/Station      145.000 to Point/Station      142.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 4 in normal stream number 2
Stream flow area =      5.310(Ac.)
Runoff from this stream =      3.066(CFS)
Time of concentration =   30.75 min.
Rainfall intensity =     0.784(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        3.053     21.06                0.958
2        3.066     30.75                0.784
Largest stream flow has longer time of concentration
Qp =      3.066 + sum of
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```
          Qb         Ia/Ib
           3.053 *    0.818 =      2.499
Qp =       5.565

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.053       3.066
Area of streams before confluence:
        4.460        5.310
Results of confluence:
Total flow rate =      5.565(CFS)
Time of concentration =    30.746 min.
Effective stream area after confluence =      9.770(Ac.)


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Process from Point/Station      142.000 to Point/Station      134.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.100(Ft.)
Downstream point/station elevation =  1496.000(Ft.)
Pipe length  =   116.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.565(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.565(CFS)
Normal flow depth in pipe =    8.72(In.)
Flow top width inside pipe =   14.80(In.)
Critical Depth =   11.47(In.)
Pipe flow velocity =      7.51(Ft/s)
Travel time through pipe =    0.26 min.
Time of concentration (TC) =    31.00 min.


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Process from Point/Station      142.000 to Point/Station      134.400
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      9.770(Ac.)
Runoff from this stream =      5.565(CFS)
Time of concentration =   31.00 min.
Rainfall intensity =     0.780(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       39.029     14.85           1.153
2        2.786     14.30           1.176
3       13.849     16.91           1.076
4        5.565     31.00           0.780
Largest stream flow has longer or shorter time of concentration
Qp =     39.029 + sum of
         Qb         Ia/Ib
          2.786 *    0.980 =      2.731
         Qa          Tb/Ta
         13.849 *    0.878 =     12.162
         Qa          Tb/Ta
          5.565 *    0.479 =      2.665
Qp =     56.586

Total of 4 main streams to confluence:
Flow rates before confluence point:
```

```
      39.029       2.786      13.849       5.565
Area of streams before confluence:
       59.770        4.150       20.400        9.770


Results of confluence:
Total flow rate =     56.586(CFS)
Time of concentration =    14.846 min.
Effective stream area after confluence  =     94.090(Ac.)


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Process from Point/Station      142.000 to Point/Station      134.400
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.416
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    14.85 min.
Rainfall intensity =      1.153(In/Hr) for a     2.0 year storm
Subarea runoff =      0.858(CFS) for      1.790(Ac.)
Total runoff =     57.444(CFS)   Total area =      95.880(Ac.)
End of computations, total study area =           95.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.724
Area averaged RI index number =  70.6
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- Area 'A' – 10 Year Post-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
       Rational Hydrology Study        Date: 11/08/21  File:PR010.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
DEVELOPED CONDITION RATIONAL METHOD - 10 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.859(In/Hr)
Slope of intensity duration curve = 0.5300




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Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   448.000(Ft.)
Top (of initial area) elevation =  1800.000(Ft.)
Bottom (of initial area) elevation =  1660.000(Ft.)
Difference in elevation =   140.000(Ft.)
Slope =    0.31250  s(percent)=      31.25
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.688 min.
Rainfall intensity =      2.551(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.784
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      6.563(CFS)
Total initial stream area =        3.280(Ac.)
Pervious area fraction = 1.000
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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of natural channel elevation =   1660.000(Ft.)
End of natural channel elevation =   1565.300(Ft.)
Length of natural channel  =   618.000(Ft.)
Estimated mean flow rate at midpoint of channel =     15.687(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =  10.38(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.1532
Corrected/adjusted channel slope =  0.1366
Travel time =    0.99 min.     TC =    8.68  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.778
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.392(In/Hr) for a    10.0 year storm
Subarea runoff =     16.966(CFS) for      9.120(Ac.)
Total runoff =     23.529(CFS)   Total area =      12.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      102.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1565.300(Ft.)
Downstream point/station elevation =  1563.000(Ft.)
Pipe length  =   123.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    23.529(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    23.529(CFS)
Normal flow depth in pipe =   15.66(In.)
Flow top width inside pipe =   22.86(In.)
Critical Depth =   20.66(In.)
Pipe flow velocity =     10.84(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =     8.87 min.


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Process from Point/Station      102.100 to Point/Station      102.100
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.762
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
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Pervious area fraction =  0.500; Impervious fraction =  0.500
Time of concentration =     8.87 min.
Rainfall intensity =      2.365(In/Hr) for a    10.0 year storm
Subarea runoff =      1.856(CFS) for      1.030(Ac.)
Total runoff =     25.385(CFS)    Total area =      13.430(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.100 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1563.000(Ft.)
Downstream point/station elevation =  1549.000(Ft.)
Pipe length  =   671.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    25.385(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    25.385(CFS)
Normal flow depth in pipe =   15.89(In.)
Flow top width inside pipe =   22.70(In.)
Critical Depth =   21.24(In.)
Pipe flow velocity =     11.49(Ft/s)
Travel time through pipe =    0.97 min.
Time of concentration (TC) =     9.84 min.


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Process from Point/Station      102.100 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.430(Ac.)
Runoff from this stream =     25.385(CFS)
Time of concentration =    9.84 min.
Rainfall intensity =     2.238(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       25.385      9.84                 2.238
Largest stream flow has longer time of concentration
Qp =     25.385 + sum of
Qp =     25.385

Total of 1 streams to confluence:
Flow rates before confluence point:
      25.385
Area of streams before confluence:
       13.430
Results of confluence:
Total flow rate =     25.385(CFS)
Time of concentration =     9.843 min.
Effective stream area after confluence =     13.430(Ac.)


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Process from Point/Station      104.000 to Point/Station      105.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   425.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1556.200(Ft.)
Difference in elevation =    15.800(Ft.)
Slope =    0.03718  s(percent)=       3.72
```

```
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.479 min.
Rainfall intensity =      2.422(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.764
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.758(CFS)
Total initial stream area =        0.950(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      105.000 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1549.200(Ft.)
Downstream point/station elevation =  1549.000(Ft.)
Pipe length  =    15.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.758(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.758(CFS)
Normal flow depth in pipe =    6.81(In.)
Flow top width inside pipe =    7.73(In.)
Critical Depth =    7.29(In.)
Pipe flow velocity =      4.91(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =     8.53 min.


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Process from Point/Station      105.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.950(Ac.)
Runoff from this stream =      1.758(CFS)
Time of concentration =    8.53 min.
Rainfall intensity =     2.414(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       25.385      9.84                 2.238
2        1.758      8.53                 2.414
Largest stream flow has longer time of concentration
Qp =     25.385 + sum of
         Qb         Ia/Ib
          1.758 *    0.927 =      1.630
Qp =     27.015

Total of 2 streams to confluence:
Flow rates before confluence point:
      25.385       1.758
Area of streams before confluence:
       13.430        0.950
Results of confluence:
Total flow rate =     27.015(CFS)
Time of concentration =     9.843 min.
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Effective stream area after confluence =     14.380(Ac.)


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Process from Point/Station      103.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1549.000(Ft.)
Downstream point/station elevation =  1548.700(Ft.)
Pipe length  =    29.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    27.015(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    27.015(CFS)
Normal flow depth in pipe =   19.27(In.)
Flow top width inside pipe =   24.41(In.)
Critical Depth =   21.75(In.)
Pipe flow velocity =      8.91(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =     9.90 min.


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Process from Point/Station      103.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     14.380(Ac.)
Runoff from this stream =     27.015(CFS)
Time of concentration =    9.90 min.
Rainfall intensity =     2.231(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      107.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   553.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1564.600(Ft.)
Difference in elevation =     7.400(Ft.)
Slope =    0.01338  s(percent)=       1.34
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.557 min.
Rainfall intensity =      2.055(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.748
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.814(CFS)
Total initial stream area =        1.180(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      107.000 to Point/Station      108.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------
Top of street segment elevation =  1564.600(Ft.)
End of street segment elevation =  1556.200(Ft.)
Length of street segment  =   684.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
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Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.988(CFS)
Depth of flow =   0.319(Ft.), Average velocity =   2.835(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   9.631(Ft.)
Flow velocity =   2.83(Ft/s)
Travel time =    4.02 min.     TC =   15.58  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.751
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.050
Decimal fraction soil group D = 0.200
RI index for soil(AMC 2)  =  60.45
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.754(In/Hr) for a    10.0 year storm
Subarea runoff =      2.252(CFS) for      1.710(Ac.)
Total runoff =      4.066(CFS)   Total area =       2.890(Ac.)
Street flow at end of street =      4.066(CFS)
Half street flow at end of street =      4.066(CFS)
Depth of flow =   0.347(Ft.), Average velocity =   3.042(Ft/s)
Flow width (from curb towards crown)=  10.999(Ft.)


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Process from Point/Station      108.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1549.200(Ft.)
Downstream point/station elevation =  1548.700(Ft.)
Pipe length  =    42.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.066(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     4.066(CFS)
Normal flow depth in pipe =    8.17(In.)
Flow top width inside pipe =   14.94(In.)
Critical Depth =    9.79(In.)
Pipe flow velocity =      5.95(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    15.70 min.


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Process from Point/Station      108.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.890(Ac.)
Runoff from this stream =      4.066(CFS)
Time of concentration =   15.70 min.
Rainfall intensity =     1.747(In/Hr)
Summary of stream data:
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Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       27.015      9.90                 2.231
2        4.066     15.70                 1.747
Largest stream flow has longer or shorter time of concentration
Qp =     27.015 + sum of
         Qa          Tb/Ta
          4.066 *    0.631 =      2.564
Qp =     29.578

Total of 2 streams to confluence:
Flow rates before confluence point:
      27.015       4.066
Area of streams before confluence:
       14.380        2.890
Results of confluence:
Total flow rate =     29.578(CFS)
Time of concentration =     9.897 min.
Effective stream area after confluence =     17.270(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1548.700(Ft.)
Downstream point/station elevation =  1523.000(Ft.)
Pipe length  =   620.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    29.578(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    29.578(CFS)
Normal flow depth in pipe =   15.82(In.)
Flow top width inside pipe =   18.10(In.)
Critical depth could not be calculated.
Pipe flow velocity =     15.21(Ft/s)
Travel time through pipe =    0.68 min.
Time of concentration (TC) =    10.58 min.


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Process from Point/Station      106.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     17.270(Ac.)
Runoff from this stream =     29.578(CFS)
Time of concentration =   10.58 min.
Rainfall intensity =     2.154(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      111.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   530.000(Ft.)
Top (of initial area) elevation =  1540.000(Ft.)
Bottom (of initial area) elevation =  1530.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01887  s(percent)=       1.89
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.312 min.
Rainfall intensity =      1.566(In/Hr) for a    10.0 year storm
UNDEVELOPED (fair cover) subarea
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Runoff Coefficient = 0.756
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.150
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.850
RI index for soil(AMC 2)  =  81.75
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.481(CFS)
Total initial stream area =        2.940(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      111.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1523.400(Ft.)
Downstream point/station elevation =  1523.000(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.481(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.481(CFS)
Normal flow depth in pipe =    9.60(In.)
Flow top width inside pipe =    9.60(In.)
Critical Depth =    9.57(In.)
Pipe flow velocity =      5.17(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =    19.44 min.


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Process from Point/Station      111.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.940(Ac.)
Runoff from this stream =      3.481(CFS)
Time of concentration =   19.44 min.
Rainfall intensity =     1.560(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       29.578     10.58                2.154
2        3.481     19.44                1.560
Largest stream flow has longer or shorter time of concentration
Qp =     29.578 + sum of
         Qa          Tb/Ta
          3.481 *    0.544 =      1.894
Qp =     31.472

Total of 2 streams to confluence:
Flow rates before confluence point:
      29.578       3.481
Area of streams before confluence:
       17.270        2.940
Results of confluence:
Total flow rate =     31.472(CFS)
Time of concentration =    10.576 min.
Effective stream area after confluence =     20.210(Ac.)


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Process from Point/Station      109.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1523.000(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    31.472(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    31.472(CFS)
Normal flow depth in pipe =   14.54(In.)
Flow top width inside pipe =   19.38(In.)
Critical depth could not be calculated.
Pipe flow velocity =     17.71(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    10.61 min.


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Process from Point/Station      109.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     20.210(Ac.)
Runoff from this stream =     31.472(CFS)
Time of concentration =   10.61 min.
Rainfall intensity =     2.150(In/Hr)


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Process from Point/Station      113.000 to Point/Station      114.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   965.000(Ft.)
Top (of initial area) elevation =  1567.900(Ft.)
Bottom (of initial area) elevation =  1556.000(Ft.)
Difference in elevation =    11.900(Ft.)
Slope =    0.01233  s(percent)=       1.23
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.678 min.
Rainfall intensity =      1.811(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.782
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.400
RI index for soil(AMC 2)  =  67.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      4.008(CFS)
Total initial stream area =        2.830(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      114.000 to Point/Station      115.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of street segment elevation =  1556.000(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   610.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
```

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Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      5.326(CFS)
Depth of flow =   0.315(Ft.), Average velocity =   5.244(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   9.429(Ft.)
Flow velocity =   5.24(Ft/s)
Travel time =    1.94 min.     TC =   16.62  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.752
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 2)  =  61.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.695(In/Hr) for a    10.0 year storm
Subarea runoff =      2.564(CFS) for      2.010(Ac.)
Total runoff =      6.572(CFS)   Total area =       4.840(Ac.)
Street flow at end of street =      6.572(CFS)
Half street flow at end of street =      6.572(CFS)
Depth of flow =   0.333(Ft.), Average velocity =   5.501(Ft/s)
Flow width (from curb towards crown)=  10.335(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1521.200(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.572(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.572(CFS)
Normal flow depth in pipe =   10.93(In.)
Flow top width inside pipe =   13.34(In.)
Critical Depth =   12.39(In.)
Pipe flow velocity =      6.86(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    16.69 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.840(Ac.)
Runoff from this stream =      6.572(CFS)
Time of concentration =   16.69 min.
Rainfall intensity =     1.692(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      127.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
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```
Initial area flow distance =   623.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1552.000(Ft.)
Difference in elevation =    20.000(Ft.)
Slope =    0.03210  s(percent)=       3.21
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.175 min.
Rainfall intensity =      2.199(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.755
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.954(CFS)
Total initial stream area =        1.780(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      127.000 to Point/Station      128.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1552.000(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   518.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      4.491(CFS)
Depth of flow =   0.301(Ft.), Average velocity =   5.044(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   8.739(Ft.)
Flow velocity =   5.04(Ft/s)
Travel time =    1.71 min.     TC =   11.89  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.769
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 2)  =  61.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.025(In/Hr) for a    10.0 year storm
Subarea runoff =      2.976(CFS) for      1.910(Ac.)
Total runoff =      5.930(CFS)   Total area =       3.690(Ac.)
Street flow at end of street =      5.930(CFS)
Half street flow at end of street =      5.930(CFS)
Depth of flow =   0.324(Ft.), Average velocity =   5.369(Ft/s)
Flow width (from curb towards crown)=   9.889(Ft.)
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Process from Point/Station      128.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1521.200(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    45.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.930(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.930(CFS)
Normal flow depth in pipe =   11.95(In.)
Flow top width inside pipe =   12.07(In.)
Critical Depth =   11.82(In.)
Pipe flow velocity =      5.66(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =    12.02 min.


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Process from Point/Station      128.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      3.690(Ac.)
Runoff from this stream =      5.930(CFS)
Time of concentration =   12.02 min.
Rainfall intensity =     2.013(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       31.472     10.61                 2.150
2        6.572     16.69                 1.692
3        5.930     12.02                 2.013
Largest stream flow has longer or shorter time of concentration
Qp =     31.472 + sum of
         Qa          Tb/Ta
          6.572 *    0.636 =      4.179
         Qa          Tb/Ta
          5.930 *    0.883 =      5.235
Qp =     40.886

Total of 3 streams to confluence:
Flow rates before confluence point:
      31.472       6.572       5.930
Area of streams before confluence:
       20.210        4.840        3.690
Results of confluence:
Total flow rate =     40.886(CFS)
Time of concentration =    10.612 min.
Effective stream area after confluence =     28.740(Ac.)


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Process from Point/Station      112.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1520.800(Ft.)
Downstream point/station elevation =  1520.000(Ft.)
Pipe length  =    32.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    40.886(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    40.886(CFS)
```

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Normal flow depth in pipe =   18.87(In.)
Flow top width inside pipe =   24.77(In.)
Critical Depth =   25.24(In.)
Pipe flow velocity =     13.79(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    10.65 min.


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Process from Point/Station      112.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     28.740(Ac.)
Runoff from this stream =     40.886(CFS)
Time of concentration =   10.65 min.
Rainfall intensity =     2.146(In/Hr)


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Process from Point/Station      117.000 to Point/Station      118.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   500.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1539.300(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.00900  s(percent)=       0.90
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.017 min.
Rainfall intensity =      2.013(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.784
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  65.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.404(CFS)
Total initial stream area =        0.890(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      118.000 to Point/Station      119.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1539.300(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   933.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.505(CFS)
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Depth of flow =   0.312(Ft.), Average velocity =   2.533(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   9.284(Ft.)
Flow velocity =   2.53(Ft/s)
Travel time =    6.14 min.     TC =   18.16  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.780
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.700
RI index for soil(AMC 2)  =  69.30
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.618(In/Hr) for a    10.0 year storm
Subarea runoff =      2.132(CFS) for      1.690(Ac.)
Total runoff =      3.536(CFS)   Total area =       2.580(Ac.)
Street flow at end of street =      3.536(CFS)
Half street flow at end of street =      3.536(CFS)
Depth of flow =   0.342(Ft.), Average velocity =   2.741(Ft/s)
Flow width (from curb towards crown)=  10.786(Ft.)


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Process from Point/Station      119.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1521.400(Ft.)
Downstream point/station elevation =  1520.000(Ft.)
Pipe length  =    57.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.536(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.536(CFS)
Normal flow depth in pipe =    6.93(In.)
Flow top width inside pipe =   11.85(In.)
Critical Depth =    9.64(In.)
Pipe flow velocity =      7.52(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =    18.28 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.580(Ac.)
Runoff from this stream =      3.536(CFS)
Time of concentration =   18.28 min.
Rainfall intensity =     1.612(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       40.886     10.65                2.146
2        3.536     18.28                1.612
Largest stream flow has longer or shorter time of concentration
Qp =     40.886 + sum of
         Qa          Tb/Ta
          3.536 *    0.583 =      2.060
Qp =     42.946

Total of 2 streams to confluence:
```

```
Flow rates before confluence point:
      40.886       3.536
Area of streams before confluence:
       28.740        2.580
Results of confluence:
Total flow rate =     42.946(CFS)
Time of concentration =    10.651 min.
Effective stream area after confluence =     31.320(Ac.)


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Process from Point/Station      116.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1520.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    42.946(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    42.946(CFS)
Normal flow depth in pipe =   23.25(In.)
Flow top width inside pipe =   30.11(In.)
Critical Depth =   26.12(In.)
Pipe flow velocity =      9.61(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    10.74 min.


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Process from Point/Station      116.000 to Point/Station      120.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     31.320(Ac.)
Runoff from this stream =     42.946(CFS)
Time of concentration =   10.74 min.
Rainfall intensity =     2.136(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      121.000 to Point/Station      122.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   193.000(Ft.)
Top (of initial area) elevation =  1546.000(Ft.)
Bottom (of initial area) elevation =  1544.700(Ft.)
Difference in elevation =     1.300(Ft.)
Slope =    0.00674  s(percent)=       0.67
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.702 min.
Rainfall intensity =      2.389(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.829
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.922(CFS)
Total initial stream area =        0.970(Ac.)
Pervious area fraction = 0.500
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Process from Point/Station      122.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1537.700(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =   496.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.922(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.922(CFS)
Normal flow depth in pipe =    5.93(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =    7.10(In.)
Pipe flow velocity =      4.96(Ft/s)
Travel time through pipe =    1.67 min.
Time of concentration (TC) =    10.37 min.


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Process from Point/Station      122.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.970(Ac.)
Runoff from this stream =      1.922(CFS)
Time of concentration =   10.37 min.
Rainfall intensity =     2.177(In/Hr)


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Process from Point/Station      124.000 to Point/Station      125.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   960.000(Ft.)
Top (of initial area) elevation =  1549.500(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =    10.500(Ft.)
Slope =    0.01094  s(percent)=       1.09
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.003 min.
Rainfall intensity =      1.790(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.781
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.600
RI index for soil(AMC 2)  =  67.40
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      6.415(CFS)
Total initial stream area =        4.590(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      125.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =    26.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.415(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.415(CFS)
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Normal flow depth in pipe =   11.39(In.)
Flow top width inside pipe =   12.82(In.)
Critical Depth =   12.25(In.)
Pipe flow velocity =      6.42(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    15.07 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      125.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      4.590(Ac.)
Runoff from this stream =      6.415(CFS)
Time of concentration =   15.07 min.
Rainfall intensity =     1.786(In/Hr)


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Process from Point/Station      124.000 to Point/Station      126.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1549.500(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =    10.500(Ft.)
Slope =    0.01050  s(percent)=       1.05
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.375 min.
Rainfall intensity =      1.767(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.787
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.700
RI index for soil(AMC 2)  =  69.30
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      6.954(CFS)
Total initial stream area =        5.000(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      126.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.954(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.954(CFS)
Normal flow depth in pipe =   10.91(In.)
Flow top width inside pipe =   13.36(In.)
Critical Depth =   12.69(In.)
Pipe flow velocity =      7.27(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    15.42 min.


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Process from Point/Station      126.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
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```
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      5.000(Ac.)
Runoff from this stream =      6.954(CFS)
Time of concentration =   15.42 min.
Rainfall intensity =     1.764(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        1.922     10.37                2.177
2        6.415     15.07                1.786
3        6.954     15.42                1.764
Largest stream flow has longer time of concentration
Qp =      6.954 + sum of
         Qb         Ia/Ib
          1.922 *    0.810 =      1.557
         Qb         Ia/Ib
          6.415 *    0.988 =      6.337
Qp =     14.848

Total of 3 streams to confluence:
Flow rates before confluence point:
       1.922       6.415       6.954
Area of streams before confluence:
        0.970        4.590        5.000
Results of confluence:
Total flow rate =     14.848(CFS)
Time of concentration =    15.421 min.
Effective stream area after confluence =     10.560(Ac.)


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Process from Point/Station      123.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1531.700(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =   800.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.848(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    14.848(CFS)
Normal flow depth in pipe =   13.69(In.)
Flow top width inside pipe =   20.01(In.)
Critical Depth =   17.14(In.)
Pipe flow velocity =      8.95(Ft/s)
Travel time through pipe =    1.49 min.
Time of concentration (TC) =    16.91 min.


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Process from Point/Station      123.000 to Point/Station      120.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     10.560(Ac.)
Runoff from this stream =     14.848(CFS)
Time of concentration =   16.91 min.
Rainfall intensity =     1.680(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
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 No.       (CFS)       (min)                (In/Hr)


1       42.946     10.74            2.136
2       14.848     16.91            1.680
Largest stream flow has longer or shorter time of concentration
Qp =     42.946 + sum of
         Qa          Tb/Ta
         14.848 *    0.635 =      9.434
Qp =     52.380

Total of 2 main streams to confluence:
Flow rates before confluence point:
      42.946      14.848
Area of streams before confluence:
       31.320       10.560


Results of confluence:
Total flow rate =     52.380(CFS)
Time of concentration =    10.744 min.
Effective stream area after confluence  =     41.880(Ac.)


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Process from Point/Station      120.000 to Point/Station      128.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1519.500(Ft.)
Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =  1360.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    52.380(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    52.380(CFS)
Normal flow depth in pipe =   26.53(In.)
Flow top width inside pipe =   31.70(In.)
Critical Depth =   28.24(In.)
Pipe flow velocity =      9.37(Ft/s)
Travel time through pipe =    2.42 min.
Time of concentration (TC) =    13.16 min.


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Process from Point/Station      120.000 to Point/Station      128.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     41.880(Ac.)
Runoff from this stream =     52.380(CFS)
Time of concentration =   13.16 min.
Rainfall intensity =     1.918(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      158.000 to Point/Station      159.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   245.000(Ft.)
Top (of initial area) elevation =  1720.000(Ft.)
Bottom (of initial area) elevation =  1659.000(Ft.)
Difference in elevation =    61.000(Ft.)
Slope =    0.24898  s(percent)=      24.90
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
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Initial area time of concentration =    6.320 min.
Rainfall intensity =      2.830(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.794
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      2.496(CFS)
Total initial stream area =        1.110(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      158.000 to Point/Station      159.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     6.32 min.
Rainfall intensity =      2.830(In/Hr) for a    10.0 year storm
Subarea runoff =      1.016(CFS) for      0.410(Ac.)
Total runoff =      3.512(CFS)   Total area =       1.520(Ac.)


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Process from Point/Station      158.000 to Point/Station      159.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     6.32 min.
Rainfall intensity =      2.830(In/Hr) for a    10.0 year storm
Subarea runoff =      1.760(CFS) for      0.710(Ac.)
Total runoff =      5.271(CFS)   Total area =       2.230(Ac.)


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Process from Point/Station      160.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1650.000(Ft.)
Downstream point/station elevation =  1512.000(Ft.)
Pipe length  =   965.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.271(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     5.271(CFS)
Normal flow depth in pipe =    6.33(In.)
Flow top width inside pipe =    8.22(In.)
Critical depth could not be calculated.
Pipe flow velocity =     15.87(Ft/s)
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Travel time through pipe =    1.01 min.
Time of concentration (TC) =     7.33 min.


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Process from Point/Station      160.000 to Point/Station      161.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      2.230(Ac.)
Runoff from this stream =      5.271(CFS)
Time of concentration =    7.33 min.
Rainfall intensity =     2.616(In/Hr)


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Process from Point/Station      162.000 to Point/Station      163.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   945.000(Ft.)
Top (of initial area) elevation =  1717.700(Ft.)
Bottom (of initial area) elevation =  1520.000(Ft.)
Difference in elevation =   197.700(Ft.)
Slope =    0.20921  s(percent)=      20.92
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.229 min.
Rainfall intensity =      2.087(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.779
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  80.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      7.541(CFS)
Total initial stream area =        4.640(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      163.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1513.000(Ft.)
Downstream point/station elevation =  1512.000(Ft.)
Pipe length  =    23.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.541(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     7.541(CFS)
Normal flow depth in pipe =    8.03(In.)
Flow top width inside pipe =   14.96(In.)
Critical Depth =   13.09(In.)
Pipe flow velocity =     11.29(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    11.26 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      163.000 to Point/Station      161.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      4.640(Ac.)
Runoff from this stream =      7.541(CFS)
```

```
Time of concentration =   11.26 min.
Rainfall intensity =     2.084(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        5.271      7.33                2.616
2        7.541     11.26                2.084
Largest stream flow has longer time of concentration
Qp =      7.541 + sum of
         Qb         Ia/Ib
          5.271 *    0.797 =      4.199
Qp =     11.740

Total of 2 streams to confluence:
Flow rates before confluence point:
       5.271       7.541
Area of streams before confluence:
        2.230        4.640
Results of confluence:
Total flow rate =     11.740(CFS)
Time of concentration =    11.263 min.
Effective stream area after confluence =      6.870(Ac.)


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Process from Point/Station      163.000 to Point/Station      161.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.769
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  79.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    11.26 min.
Rainfall intensity =      2.084(In/Hr) for a    10.0 year storm
Subarea runoff =      0.962(CFS) for      0.600(Ac.)
Total runoff =     12.701(CFS)   Total area =       7.470(Ac.)


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Process from Point/Station      161.000 to Point/Station      128.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1512.000(Ft.)
Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =   567.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.701(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    12.701(CFS)
Normal flow depth in pipe =   15.82(In.)
Flow top width inside pipe =   22.75(In.)
Critical Depth =   15.38(In.)
Pipe flow velocity =      5.78(Ft/s)
Travel time through pipe =    1.63 min.
Time of concentration (TC) =    12.90 min.


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Process from Point/Station      161.000 to Point/Station      128.000
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**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      7.470(Ac.)
Runoff from this stream =     12.701(CFS)
Time of concentration =   12.90 min.
Rainfall intensity =     1.939(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       52.380     13.16           1.918
2       12.701     12.90           1.939
Largest stream flow has longer time of concentration
Qp =     52.380 + sum of
         Qb         Ia/Ib
         12.701 *    0.989 =     12.565
Qp =     64.945

Total of 2 main streams to confluence:
Flow rates before confluence point:
      52.380      12.701
Area of streams before confluence:
       41.880        7.470


Results of confluence:
Total flow rate =     64.945(CFS)
Time of concentration =    13.163 min.
Effective stream area after confluence  =     49.350(Ac.)


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Process from Point/Station      128.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1509.000(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =   333.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    64.945(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    64.945(CFS)
Normal flow depth in pipe =   22.64(In.)
Flow top width inside pipe =   25.82(In.)
Critical depth could not be calculated.
Pipe flow velocity =     16.34(Ft/s)
Travel time through pipe =    0.34 min.
Time of concentration (TC) =    13.50 min.


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Process from Point/Station      128.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
_____________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     49.350(Ac.)
Runoff from this stream =     64.945(CFS)
Time of concentration =   13.50 min.
Rainfall intensity =     1.893(In/Hr)


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Process from Point/Station      130.000 to Point/Station      131.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   994.000(Ft.)
Top (of initial area) elevation =  1521.000(Ft.)
Bottom (of initial area) elevation =  1508.600(Ft.)
Difference in elevation =    12.400(Ft.)
Slope =    0.01247  s(percent)=       1.25
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.819 min.
Rainfall intensity =      1.802(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.758
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 2)  =  61.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.197(CFS)
Total initial stream area =        2.340(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      131.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1499.400(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =    22.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.197(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.197(CFS)
Normal flow depth in pipe =    7.89(In.)
Flow top width inside pipe =   11.39(In.)
Critical Depth =    9.20(In.)
Pipe flow velocity =      5.84(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    14.88 min.


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Process from Point/Station      131.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.340(Ac.)
Runoff from this stream =      3.197(CFS)
Time of concentration =   14.88 min.
Rainfall intensity =     1.798(In/Hr)


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Process from Point/Station      132.000 to Point/Station      133.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   636.000(Ft.)
Top (of initial area) elevation =  1526.500(Ft.)
Bottom (of initial area) elevation =  1519.100(Ft.)
Difference in elevation =     7.400(Ft.)
Slope =    0.01164  s(percent)=       1.16
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.569 min.
Rainfall intensity =      1.966(In/Hr) for a    10.0 year storm
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SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.817
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.184(CFS)
Total initial stream area =        1.360(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      133.000 to Point/Station      134.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1519.100(Ft.)
End of street segment elevation =  1510.100(Ft.)
Length of street segment  =   806.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      6.590(CFS)
Depth of flow =   0.401(Ft.), Average velocity =   3.288(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.703(Ft.)
Flow velocity =   3.29(Ft/s)
Travel time =    4.09 min.     TC =   16.65  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.768
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  65.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.693(In/Hr) for a    10.0 year storm
Subarea runoff =      8.741(CFS) for      6.720(Ac.)
Total runoff =     10.925(CFS)   Total area =       8.080(Ac.)
Street flow at end of street =     10.925(CFS)
Half street flow at end of street =     10.925(CFS)
Depth of flow =   0.462(Ft.), Average velocity =   3.714(Ft/s)
Flow width (from curb towards crown)=  16.777(Ft.)


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Process from Point/Station      134.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1499.400(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.925(CFS)
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Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.925(CFS)
Normal flow depth in pipe =   13.99(In.)
Flow top width inside pipe =   14.98(In.)
Critical Depth =   15.20(In.)
Pipe flow velocity =      7.41(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    16.71 min.


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Process from Point/Station      134.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      8.080(Ac.)
Runoff from this stream =     10.925(CFS)
Time of concentration =   16.71 min.
Rainfall intensity =     1.690(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       64.945     13.50                1.893
2        3.197     14.88                1.798
3       10.925     16.71                1.690
Largest stream flow has longer or shorter time of concentration
Qp =     64.945 + sum of
         Qa          Tb/Ta
          3.197 *    0.907 =      2.901
         Qa          Tb/Ta
         10.925 *    0.808 =      8.828
Qp =     76.674

Total of 3 streams to confluence:
Flow rates before confluence point:
      64.945       3.197      10.925
Area of streams before confluence:
       49.350        2.340        8.080
Results of confluence:
Total flow rate =     76.674(CFS)
Time of concentration =    13.502 min.
Effective stream area after confluence =     59.770(Ac.)


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Process from Point/Station      129.000 to Point/Station      135.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1499.100(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =   107.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    76.674(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    76.674(CFS)
Normal flow depth in pipe =   29.34(In.)
Flow top width inside pipe =   33.67(In.)
Critical Depth =   33.12(In.)
Pipe flow velocity =     11.44(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    13.66 min.
```

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Process from Point/Station      129.000 to Point/Station      135.100
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     59.770(Ac.)
Runoff from this stream =     76.674(CFS)
Time of concentration =   13.66 min.
Rainfall intensity =     1.881(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      136.000 to Point/Station      137.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   616.000(Ft.)
Top (of initial area) elevation =  1515.100(Ft.)
Bottom (of initial area) elevation =  1506.700(Ft.)
Difference in elevation =     8.400(Ft.)
Slope =    0.01364  s(percent)=       1.36
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.021 min.
Rainfall intensity =      2.013(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.637
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  32.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.295(CFS)
Total initial stream area =        1.790(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      137.000 to Point/Station      138.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.900(Ft.)
Downstream point/station elevation =  1498.400(Ft.)
Pipe length  =    47.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.295(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.295(CFS)
Normal flow depth in pipe =    6.87(In.)
Flow top width inside pipe =   11.87(In.)
Critical Depth =    7.77(In.)
Pipe flow velocity =      4.94(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    12.18 min.


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Process from Point/Station      137.000 to Point/Station      138.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      1.790(Ac.)
Runoff from this stream =      2.295(CFS)
Time of concentration =   12.18 min.
Rainfall intensity =     1.999(In/Hr)
```

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Process from Point/Station      139.000 to Point/Station      140.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   701.000(Ft.)
Top (of initial area) elevation =  1512.200(Ft.)
Bottom (of initial area) elevation =  1506.700(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.00785  s(percent)=       0.78
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.139 min.
Rainfall intensity =      1.847(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.737
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.213(CFS)
Total initial stream area =        2.360(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      140.000 to Point/Station      138.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1498.600(Ft.)
Downstream point/station elevation =  1498.400(Ft.)
Pipe length  =    10.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.213(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.213(CFS)
Normal flow depth in pipe =    6.96(In.)
Flow top width inside pipe =   11.85(In.)
Critical Depth =    9.22(In.)
Pipe flow velocity =      6.80(Ft/s)
Travel time through pipe =    0.02 min.
Time of concentration (TC) =    14.16 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      140.000 to Point/Station      138.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      2.360(Ac.)
Runoff from this stream =      3.213(CFS)
Time of concentration =   14.16 min.
Rainfall intensity =     1.845(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        2.295     12.18                1.999
2        3.213     14.16                1.845
Largest stream flow has longer time of concentration
Qp =      3.213 + sum of
         Qb         Ia/Ib
```

```
          2.295 *    0.923 =      2.118
Qp =      5.332

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.295       3.213
Area of streams before confluence:
        1.790        2.360
Results of confluence:
Total flow rate =      5.332(CFS)
Time of concentration =    14.164 min.
Effective stream area after confluence =      4.150(Ac.)


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Process from Point/Station      138.000 to Point/Station      135.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.400(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.332(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.332(CFS)
Normal flow depth in pipe =   10.38(In.)
Flow top width inside pipe =   13.85(In.)
Critical Depth =   11.24(In.)
Pipe flow velocity =      5.88(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =    14.28 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      138.000 to Point/Station      135.200
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      4.150(Ac.)
Runoff from this stream =      5.332(CFS)
Time of concentration =   14.28 min.
Rainfall intensity =     1.838(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      146.000 to Point/Station      147.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1744.000(Ft.)
Bottom (of initial area) elevation =  1579.000(Ft.)
Difference in elevation =   165.000(Ft.)
Slope =    0.16500  s(percent)=      16.50
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.044 min.
Rainfall intensity =      2.011(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.758
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
```

```
Initial subarea runoff =      6.510(CFS)
Total initial stream area =        4.270(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      147.000 to Point/Station      148.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =  1579.000(Ft.)
Downstream point elevation =  1568.000(Ft.)
Channel length thru subarea  =   185.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      7.061(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      7.061(CFS)
Depth of flow =   0.775(Ft.), Average velocity =  11.758(Ft/s)
Channel flow top width =    1.550(Ft.)
Flow Velocity =   11.76(Ft/s)
Travel time  =    0.26 min.
Time of concentration =   12.31 min.

Sub-Channel No. 1 Critical depth =      1.250(Ft.)
  '     '       '     Critical flow top width =      2.500(Ft.)
  '     '       '     Critical flow velocity=    4.519(Ft/s)
  '     '       '     Critical flow area =      1.563(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.692
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.988(In/Hr) for a    10.0 year storm
Subarea runoff =      1.045(CFS) for      0.760(Ac.)
Total runoff =      7.555(CFS)   Total area =       5.030(Ac.)
Depth of flow =   0.795(Ft.), Average velocity =  11.958(Ft/s)

Sub-Channel No. 1 Critical depth =      1.289(Ft.)
  '     '       '     Critical flow top width =      2.578(Ft.)
  '     '       '     Critical flow velocity=    4.547(Ft/s)
  '     '       '     Critical flow area =      1.662(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      147.000 to Point/Station      148.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.757
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    12.31 min.
Rainfall intensity =      1.988(In/Hr) for a    10.0 year storm
```

```
Subarea runoff =      3.611(CFS) for      2.400(Ac.)
Total runoff =     11.166(CFS)    Total area =       7.430(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      148.000 to Point/Station      149.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =  1568.000(Ft.)
Downstream point elevation =  1560.000(Ft.)
Channel length thru subarea  =   220.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =     11.467(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =     11.467(CFS)
Depth of flow =   1.019(Ft.), Average velocity =  11.038(Ft/s)
Channel flow top width =    2.038(Ft.)
Flow Velocity =   11.04(Ft/s)
Travel time  =    0.33 min.
Time of concentration =   12.64 min.

Sub-Channel No. 1 Critical depth =      1.516(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    4.992(Ft/s)
  '     '       '     Critical flow area =      2.297(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.689
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.960(In/Hr) for a    10.0 year storm
Subarea runoff =      0.540(CFS) for      0.400(Ac.)
Total runoff =     11.707(CFS)    Total area =       7.830(Ac.)
Depth of flow =   1.027(Ft.), Average velocity =  11.095(Ft/s)

Sub-Channel No. 1 Critical depth =      1.531(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    4.995(Ft/s)
  '     '       '     Critical flow area =      2.344(Sq.Ft)



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Process from Point/Station      149.000 to Point/Station      150.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =  1560.000(Ft.)
Downstream point elevation =  1555.000(Ft.)
Channel length thru subarea  =   190.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =     12.420(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =     12.420(CFS)
Depth of flow =   1.116(Ft.), Average velocity =   9.975(Ft/s)
```

```
Channel flow top width =    2.232(Ft.)
Flow Velocity =    9.97(Ft/s)
Travel time  =    0.32 min.
Time of concentration =   12.96 min.

Sub-Channel No. 1 Critical depth =      1.563(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    5.095(Ft/s)
  '     '       '     Critical flow area =      2.438(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.687
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.935(In/Hr) for a    10.0 year storm
Subarea runoff =      1.343(CFS) for      1.010(Ac.)
Total runoff =     13.049(CFS)   Total area =       8.840(Ac.)
Depth of flow =   1.137(Ft.), Average velocity =  10.099(Ft/s)

Sub-Channel No. 1 Critical depth =      1.586(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    5.203(Ft/s)
  '     '       '     Critical flow area =      2.508(Sq.Ft)



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Process from Point/Station      149.000 to Point/Station      150.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.754
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    12.96 min.
Rainfall intensity =      1.935(In/Hr) for a    10.0 year storm
Subarea runoff =      4.956(CFS) for      3.400(Ac.)
Total runoff =     18.005(CFS)   Total area =      12.240(Ac.)


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Process from Point/Station      150.000 to Point/Station      151.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =  1555.000(Ft.)
Downstream point elevation =  1536.000(Ft.)
Channel length thru subarea  =   330.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =     18.373(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =     18.373(CFS)
Depth of flow =   1.116(Ft.), Average velocity =  14.754(Ft/s)
Channel flow top width =    2.232(Ft.)
```

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Flow Velocity =   14.75(Ft/s)
Travel time  =    0.37 min.
Time of concentration =   13.33 min.

Sub-Channel No. 1 Critical depth =      1.797(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    5.850(Ft/s)
  '     '       '     Critical flow area =      3.141(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.685
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.906(In/Hr) for a    10.0 year storm
Subarea runoff =      0.652(CFS) for      0.500(Ac.)
Total runoff =     18.658(CFS)   Total area =      12.740(Ac.)
Depth of flow =   1.122(Ft.), Average velocity =  14.811(Ft/s)

Sub-Channel No. 1 Critical depth =      1.813(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    5.853(Ft/s)
  '     '       '     Critical flow area =      3.188(Sq.Ft)



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Process from Point/Station      151.000 to Point/Station      152.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1534.000(Ft.)
Downstream point/station elevation =  1533.000(Ft.)
Pipe length  =   104.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    18.658(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    18.658(CFS)
Normal flow depth in pipe =   16.85(In.)
Flow top width inside pipe =   21.95(In.)
Critical Depth =   18.66(In.)
Pipe flow velocity =      7.91(Ft/s)
Travel time through pipe =    0.22 min.
Time of concentration (TC) =    13.55 min.


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Process from Point/Station      151.000 to Point/Station      152.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     12.740(Ac.)
Runoff from this stream =     18.658(CFS)
Time of concentration =   13.55 min.
Rainfall intensity =     1.889(In/Hr)


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Process from Point/Station      153.000 to Point/Station      152.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   727.000(Ft.)
Top (of initial area) elevation =  1707.000(Ft.)
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Bottom (of initial area) elevation =  1537.000(Ft.)
Difference in elevation =   170.000(Ft.)
Slope =    0.23384  s(percent)=      23.38
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.888 min.
Rainfall intensity =      2.232(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.805
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  83.50
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      6.110(CFS)
Total initial stream area =        3.400(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      153.000 to Point/Station      152.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      3.400(Ac.)
Runoff from this stream =      6.110(CFS)
Time of concentration =    9.89 min.
Rainfall intensity =     2.232(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       18.658     13.55                 1.889
2        6.110      9.89                 2.232
Largest stream flow has longer time of concentration
Qp =     18.658 + sum of
         Qb         Ia/Ib
          6.110 *    0.846 =      5.171
Qp =     23.829

Total of 2 streams to confluence:
Flow rates before confluence point:
      18.658       6.110
Area of streams before confluence:
       12.740        3.400
Results of confluence:
Total flow rate =     23.829(CFS)
Time of concentration =    13.548 min.
Effective stream area after confluence =     16.140(Ac.)


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Process from Point/Station      152.000 to Point/Station      154.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =   440.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    23.829(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    23.829(CFS)
Normal flow depth in pipe =   15.00(In.)
Flow top width inside pipe =   18.97(In.)
```

```
Critical depth could not be calculated.
Pipe flow velocity =     12.97(Ft/s)
Travel time through pipe =    0.57 min.
Time of concentration (TC) =    14.11 min.


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Process from Point/Station      152.000 to Point/Station      154.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     16.140(Ac.)
Runoff from this stream =     23.829(CFS)
Time of concentration =   14.11 min.
Rainfall intensity =     1.849(In/Hr)


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Process from Point/Station      155.000 to Point/Station      156.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   320.000(Ft.)
Top (of initial area) elevation =  1575.000(Ft.)
Bottom (of initial area) elevation =  1528.000(Ft.)
Difference in elevation =    47.000(Ft.)
Slope =    0.14688  s(percent)=      14.69
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.470 min.
Rainfall intensity =      2.166(In/Hr) for a    10.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.806
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  84.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.960(CFS)
Total initial stream area =        0.550(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      156.000 to Point/Station      154.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1528.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =    36.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.960(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.960(CFS)
Normal flow depth in pipe =    2.46(In.)
Flow top width inside pipe =    5.90(In.)
Critical Depth =    5.62(In.)
Pipe flow velocity =     12.67(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    10.52 min.


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Process from Point/Station      156.000 to Point/Station      154.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 2
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Stream flow area =      0.550(Ac.)
Runoff from this stream =      0.960(CFS)
Time of concentration =   10.52 min.
Rainfall intensity =     2.161(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       23.829     14.11                 1.849
2        0.960     10.52                 2.161
Largest stream flow has longer time of concentration
Qp =     23.829 + sum of
         Qb         Ia/Ib
          0.960 *    0.856 =      0.821
Qp =     24.650

Total of 2 streams to confluence:
Flow rates before confluence point:
      23.829       0.960
Area of streams before confluence:
       16.140        0.550
Results of confluence:
Total flow rate =     24.650(CFS)
Time of concentration =    14.113 min.
Effective stream area after confluence =     16.690(Ac.)


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Process from Point/Station      154.000 to Point/Station      157.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1519.500(Ft.)
Downstream point/station elevation =  1509.800(Ft.)
Pipe length  =   660.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    24.650(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    24.650(CFS)
Normal flow depth in pipe =   17.77(In.)
Flow top width inside pipe =   21.05(In.)
Critical Depth =   21.02(In.)
Pipe flow velocity =      9.88(Ft/s)
Travel time through pipe =    1.11 min.
Time of concentration (TC) =    15.23 min.


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Process from Point/Station      154.000 to Point/Station      157.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     16.690(Ac.)
Runoff from this stream =     24.650(CFS)
Time of concentration =   15.23 min.
Rainfall intensity =     1.776(In/Hr)


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Process from Point/Station      158.000 to Point/Station      159.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   442.000(Ft.)
Top (of initial area) elevation =  1640.000(Ft.)
Bottom (of initial area) elevation =  1535.000(Ft.)
```

```
Difference in elevation =   105.000(Ft.)
Slope =    0.23756  s(percent)=      23.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.078 min.
Rainfall intensity =      2.485(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.828
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  86.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      4.217(CFS)
Total initial stream area =        2.050(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      159.000 to Point/Station      157.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1509.800(Ft.)
Pipe length  =    65.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.217(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     4.217(CFS)
Normal flow depth in pipe =    4.11(In.)
Flow top width inside pipe =    8.97(In.)
Critical depth could not be calculated.
Pipe flow velocity =     21.49(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =     8.13 min.


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Process from Point/Station      159.000 to Point/Station      157.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      2.050(Ac.)
Runoff from this stream =      4.217(CFS)
Time of concentration =    8.13 min.
Rainfall intensity =     2.477(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       24.650     15.23                1.776
2        4.217      8.13                2.477
Largest stream flow has longer time of concentration
Qp =     24.650 + sum of
         Qb         Ia/Ib
          4.217 *    0.717 =      3.023
Qp =     27.673

Total of 2 streams to confluence:
Flow rates before confluence point:
      24.650       4.217
Area of streams before confluence:
       16.690        2.050
Results of confluence:
```

```
Total flow rate =     27.673(CFS)
Time of concentration =    15.227 min.
Effective stream area after confluence =     18.740(Ac.)


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Process from Point/Station      157.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1509.800(Ft.)
Downstream point/station elevation =  1503.800(Ft.)
Pipe length  =   307.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    27.673(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    27.673(CFS)
Normal flow depth in pipe =   17.39(In.)
Flow top width inside pipe =   21.44(In.)
Critical Depth =   21.86(In.)
Pipe flow velocity =     11.35(Ft/s)
Travel time through pipe =    0.45 min.
Time of concentration (TC) =    15.68 min.


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Process from Point/Station      157.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     18.740(Ac.)
Runoff from this stream =     27.673(CFS)
Time of concentration =   15.68 min.
Rainfall intensity =     1.749(In/Hr)


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Process from Point/Station      161.000 to Point/Station      162.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   570.000(Ft.)
Top (of initial area) elevation =  1630.000(Ft.)
Bottom (of initial area) elevation =  1535.000(Ft.)
Difference in elevation =    95.000(Ft.)
Slope =    0.16667  s(percent)=      16.67
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.600 min.
Rainfall intensity =      2.268(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.806
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  83.50
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.035(CFS)
Total initial stream area =        1.660(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      162.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1503.800(Ft.)
```

```
Pipe length  =    72.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.035(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     3.035(CFS)
Normal flow depth in pipe =    4.25(In.)
Flow top width inside pipe =    5.46(In.)
Critical depth could not be calculated.
Pipe flow velocity =     20.43(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =     9.66 min.


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Process from Point/Station      162.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      1.660(Ac.)
Runoff from this stream =      3.035(CFS)
Time of concentration =    9.66 min.
Rainfall intensity =     2.260(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       27.673     15.68                1.749
2        3.035      9.66                2.260
Largest stream flow has longer time of concentration
Qp =     27.673 + sum of
         Qb         Ia/Ib
          3.035 *    0.774 =      2.348
Qp =     30.021

Total of 2 streams to confluence:
Flow rates before confluence point:
      27.673       3.035
Area of streams before confluence:
       18.740        1.660
Results of confluence:
Total flow rate =     30.021(CFS)
Time of concentration =    15.678 min.
Effective stream area after confluence =     20.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      160.000 to Point/Station      135.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1503.800(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =   256.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    30.021(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    30.021(CFS)
Normal flow depth in pipe =   17.51(In.)
Flow top width inside pipe =   21.32(In.)
Critical Depth =   22.35(In.)
Pipe flow velocity =     12.23(Ft/s)
Travel time through pipe =    0.35 min.
Time of concentration (TC) =    16.03 min.


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Process from Point/Station      160.000 to Point/Station      135.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =     20.400(Ac.)
Runoff from this stream =     30.021(CFS)
Time of concentration =   16.03 min.
Rainfall intensity =     1.728(In/Hr)
Program is now starting with Main Stream No. 4


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      128.000 to Point/Station      140.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   580.000(Ft.)
Top (of initial area) elevation =  1529.800(Ft.)
Bottom (of initial area) elevation =  1523.300(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.01121  s(percent)=       1.12
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.205 min.
Rainfall intensity =      1.997(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.818
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.124(CFS)
Total initial stream area =        1.300(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      140.000 to Point/Station      141.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
____________________________________________________________________________
Top of street segment elevation =  1523.300(Ft.)
End of street segment elevation =  1504.000(Ft.)
Length of street segment  =  1420.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      4.031(CFS)
Depth of flow =   0.341(Ft.), Average velocity =   3.157(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  10.725(Ft.)
Flow velocity =   3.16(Ft/s)
Travel time =    7.50 min.     TC =   19.70  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
```

```
Runoff Coefficient = 0.760
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  65.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.549(In/Hr) for a    10.0 year storm
Subarea runoff =      3.719(CFS) for      3.160(Ac.)
Total runoff =      5.842(CFS)   Total area =       4.460(Ac.)
Street flow at end of street =      5.842(CFS)
Half street flow at end of street =      5.842(CFS)
Depth of flow =   0.377(Ft.), Average velocity =   3.444(Ft/s)
Flow width (from curb towards crown)=  12.530(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      141.000 to Point/Station      142.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.800(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =    70.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.842(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.842(CFS)
Normal flow depth in pipe =   10.58(In.)
Flow top width inside pipe =   13.67(In.)
Critical Depth =   11.73(In.)
Pipe flow velocity =      6.31(Ft/s)
Travel time through pipe =    0.18 min.
Time of concentration (TC) =    19.89 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      141.000 to Point/Station      142.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 4 in normal stream number 1
Stream flow area =      4.460(Ac.)
Runoff from this stream =      5.842(CFS)
Time of concentration =   19.89 min.
Rainfall intensity =     1.542(In/Hr)


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Process from Point/Station      117.000 to Point/Station      143.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   722.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1537.300(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.00900  s(percent)=       0.90
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.919 min.
Rainfall intensity =      1.862(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.777
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  65.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
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Initial subarea runoff =      1.664(CFS)
Total initial stream area =        1.150(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      143.000 to Point/Station      144.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of street segment elevation =  1537.300(Ft.)
End of street segment elevation =  1528.600(Ft.)
Length of street segment  =   863.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.505(CFS)
Depth of flow =   0.313(Ft.), Average velocity =   2.524(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   9.306(Ft.)
Flow velocity =   2.52(Ft/s)
Travel time =    5.70 min.     TC =   19.62  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.792
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.100
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.900
RI index for soil(AMC 2)  =  73.10
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.553(In/Hr) for a    10.0 year storm
Subarea runoff =      1.611(CFS) for      1.310(Ac.)
Total runoff =      3.275(CFS)   Total area =       2.460(Ac.)
Street flow at end of street =      3.275(CFS)
Half street flow at end of street =      3.275(CFS)
Depth of flow =   0.336(Ft.), Average velocity =   2.682(Ft/s)
Flow width (from curb towards crown)=  10.460(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      144.000 to Point/Station      145.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of street segment elevation =  1528.600(Ft.)
End of street segment elevation =  1498.100(Ft.)
Length of street segment  =  1850.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
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Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      4.657(CFS)
Depth of flow =   0.346(Ft.), Average velocity =   3.516(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  10.945(Ft.)
Flow velocity =   3.52(Ft/s)
Travel time =    8.77 min.     TC =   28.39  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.740
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  65.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.277(In/Hr) for a    10.0 year storm
Subarea runoff =      2.693(CFS) for      2.850(Ac.)
Total runoff =      5.968(CFS)   Total area =       5.310(Ac.)
Street flow at end of street =      5.968(CFS)
Half street flow at end of street =      5.968(CFS)
Depth of flow =   0.370(Ft.), Average velocity =   3.726(Ft/s)
Flow width (from curb towards crown)=  12.145(Ft.)


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Process from Point/Station      145.000 to Point/Station      142.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1498.600(Ft.)
Downstream point/station elevation =  1498.100(Ft.)
Pipe length  =    50.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.968(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.968(CFS)
Normal flow depth in pipe =   11.38(In.)
Flow top width inside pipe =   12.84(In.)
Critical Depth =   11.85(In.)
Pipe flow velocity =      5.98(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =    28.53 min.


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Process from Point/Station      145.000 to Point/Station      142.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 4 in normal stream number 2
Stream flow area =      5.310(Ac.)
Runoff from this stream =      5.968(CFS)
Time of concentration =   28.53 min.
Rainfall intensity =     1.273(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        5.842     19.89                1.542
2        5.968     28.53                1.273
Largest stream flow has longer time of concentration
Qp =      5.968 + sum of
```

```
         Qb         Ia/Ib
          5.842 *    0.826 =      4.825
Qp =     10.793

Total of 2 streams to confluence:
Flow rates before confluence point:
       5.842       5.968
Area of streams before confluence:
        4.460        5.310
Results of confluence:
Total flow rate =     10.793(CFS)
Time of concentration =    28.528 min.
Effective stream area after confluence =      9.770(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      142.000 to Point/Station      134.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.100(Ft.)
Downstream point/station elevation =  1496.000(Ft.)
Pipe length  =   116.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.793(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.793(CFS)
Normal flow depth in pipe =   11.78(In.)
Flow top width inside pipe =   17.12(In.)
Critical Depth =   15.12(In.)
Pipe flow velocity =      8.81(Ft/s)
Travel time through pipe =    0.22 min.
Time of concentration (TC) =    28.75 min.


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Process from Point/Station      142.000 to Point/Station      134.400
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      9.770(Ac.)
Runoff from this stream =     10.793(CFS)
Time of concentration =   28.75 min.
Rainfall intensity =     1.268(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       76.674     13.66           1.881
2        5.332     14.28           1.838
3       30.021     16.03           1.728
4       10.793     28.75           1.268
Largest stream flow has longer or shorter time of concentration
Qp =     76.674 + sum of
         Qa          Tb/Ta
          5.332 *    0.957 =      5.100
         Qa          Tb/Ta
         30.021 *    0.852 =     25.584
         Qa          Tb/Ta
         10.793 *    0.475 =      5.128
Qp =    112.486

Total of 4 main streams to confluence:
Flow rates before confluence point:
```

```
      76.674       5.332      30.021      10.793
Area of streams before confluence:
       59.770        4.150       20.400        9.770


Results of confluence:
Total flow rate =    112.486(CFS)
Time of concentration =    13.658 min.
Effective stream area after confluence  =     94.090(Ac.)


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Process from Point/Station      142.000 to Point/Station      134.400
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.683
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    13.66 min.
Rainfall intensity =      1.881(In/Hr) for a    10.0 year storm
Subarea runoff =      2.299(CFS) for      1.790(Ac.)
Total runoff =    114.785(CFS)   Total area =      95.880(Ac.)
End of computations, total study area =           95.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.724
Area averaged RI index number =  70.6
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- Area 'A' – 100 Year Post-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
       Rational Hydrology Study        Date: 11/08/21  File:PR100.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
DEVELOPED CONDITION RATIONAL METHOD - 100 YEAR STORM
HUNSAKER & ASSOCIATES, BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 3

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.300(In/Hr)
Slope of intensity duration curve = 0.5300




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Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   448.000(Ft.)
Top (of initial area) elevation =  1800.000(Ft.)
Bottom (of initial area) elevation =  1660.000(Ft.)
Difference in elevation =   140.000(Ft.)
Slope =    0.31250  s(percent)=      31.25
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.688 min.
Rainfall intensity =      3.863(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.866
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     10.972(CFS)
Total initial stream area =        3.280(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      101.000 to Point/Station      102.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of natural channel elevation =   1660.000(Ft.)
End of natural channel elevation =   1565.300(Ft.)
Length of natural channel  =   618.000(Ft.)
Estimated mean flow rate at midpoint of channel =     26.226(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =  11.93(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.1532
Corrected/adjusted channel slope =  0.1366
Travel time =    0.86 min.     TC =    8.55  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.864
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      3.651(In/Hr) for a   100.0 year storm
Subarea runoff =     28.771(CFS) for      9.120(Ac.)
Total runoff =     39.743(CFS)   Total area =      12.400(Ac.)


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Process from Point/Station      102.000 to Point/Station      102.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1565.300(Ft.)
Downstream point/station elevation =  1563.000(Ft.)
Pipe length  =   123.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    39.743(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    39.743(CFS)
Normal flow depth in pipe =   20.77(In.)
Flow top width inside pipe =   22.76(In.)
Critical Depth =   25.06(In.)
Pipe flow velocity =     12.11(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =     8.72 min.


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Process from Point/Station      102.100 to Point/Station      102.100
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.850
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Time of concentration =     8.72 min.
```

```
Rainfall intensity =      3.613(In/Hr) for a   100.0 year storm
Subarea runoff =      3.164(CFS) for      1.030(Ac.)
Total runoff =     42.907(CFS)    Total area =      13.430(Ac.)


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Process from Point/Station      102.100 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1563.000(Ft.)
Downstream point/station elevation =  1549.000(Ft.)
Pipe length  =   671.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    42.907(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    42.907(CFS)
Normal flow depth in pipe =   21.19(In.)
Flow top width inside pipe =   22.19(In.)
Critical Depth =   25.50(In.)
Pipe flow velocity =     12.81(Ft/s)
Travel time through pipe =    0.87 min.
Time of concentration (TC) =     9.59 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.100 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.430(Ac.)
Runoff from this stream =     42.907(CFS)
Time of concentration =    9.59 min.
Rainfall intensity =     3.435(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       42.907      9.59                 3.435
Largest stream flow has longer time of concentration
Qp =     42.907 + sum of
Qp =     42.907

Total of 1 streams to confluence:
Flow rates before confluence point:
      42.907
Area of streams before confluence:
       13.430
Results of confluence:
Total flow rate =     42.907(CFS)
Time of concentration =     9.594 min.
Effective stream area after confluence =     13.430(Ac.)


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Process from Point/Station      104.000 to Point/Station      105.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   425.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1556.200(Ft.)
Difference in elevation =    15.800(Ft.)
Slope =    0.03718  s(percent)=       3.72
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.479 min.
```

```
Rainfall intensity =      3.667(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.851
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.964(CFS)
Total initial stream area =        0.950(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1549.200(Ft.)
Downstream point/station elevation =  1549.000(Ft.)
Pipe length  =    15.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.964(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.964(CFS)
Normal flow depth in pipe =    7.55(In.)
Flow top width inside pipe =   11.59(In.)
Critical Depth =    8.86(In.)
Pipe flow velocity =      5.70(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     8.52 min.


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Process from Point/Station      105.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.950(Ac.)
Runoff from this stream =      2.964(CFS)
Time of concentration =    8.52 min.
Rainfall intensity =     3.657(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       42.907      9.59                3.435
2        2.964      8.52                3.657
Largest stream flow has longer time of concentration
Qp =     42.907 + sum of
         Qb         Ia/Ib
          2.964 *    0.939 =      2.784
Qp =     45.692

Total of 2 streams to confluence:
Flow rates before confluence point:
      42.907       2.964
Area of streams before confluence:
       13.430        0.950
Results of confluence:
Total flow rate =     45.692(CFS)
Time of concentration =     9.594 min.
Effective stream area after confluence =     14.380(Ac.)
```

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Process from Point/Station      103.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1549.000(Ft.)
Downstream point/station elevation =  1548.700(Ft.)
Pipe length  =    29.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    45.692(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    45.692(CFS)
Normal flow depth in pipe =   23.34(In.)
Flow top width inside pipe =   30.03(In.)
Critical Depth =   26.86(In.)
Pipe flow velocity =     10.16(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =     9.64 min.


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Process from Point/Station      103.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     14.380(Ac.)
Runoff from this stream =     45.692(CFS)
Time of concentration =    9.64 min.
Rainfall intensity =     3.426(In/Hr)


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Process from Point/Station      104.000 to Point/Station      107.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   553.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1564.600(Ft.)
Difference in elevation =     7.400(Ft.)
Slope =    0.01338  s(percent)=       1.34
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.557 min.
Rainfall intensity =      3.112(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.843
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.097(CFS)
Total initial stream area =        1.180(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      107.000 to Point/Station      108.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of street segment elevation =  1564.600(Ft.)
End of street segment elevation =  1556.200(Ft.)
Length of street segment  =   684.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
```

```
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      5.087(CFS)
Depth of flow =   0.368(Ft.), Average velocity =   3.206(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  12.083(Ft.)
Flow velocity =   3.21(Ft/s)
Travel time =    3.56 min.     TC =   15.11  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.846
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.050
Decimal fraction soil group D = 0.200
RI index for soil(AMC 3)  =  78.36
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.700(In/Hr) for a   100.0 year storm
Subarea runoff =      3.905(CFS) for      1.710(Ac.)
Total runoff =      7.002(CFS)   Total area =       2.890(Ac.)
Street flow at end of street =      7.002(CFS)
Half street flow at end of street =      7.002(CFS)
Depth of flow =   0.402(Ft.), Average velocity =   3.459(Ft/s)
Flow width (from curb towards crown)=  13.775(Ft.)


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Process from Point/Station      108.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1549.200(Ft.)
Downstream point/station elevation =  1548.700(Ft.)
Pipe length  =    42.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.002(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     7.002(CFS)
Normal flow depth in pipe =   12.21(In.)
Flow top width inside pipe =   11.67(In.)
Critical Depth =   12.71(In.)
Pipe flow velocity =      6.55(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =    15.22 min.


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Process from Point/Station      108.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.890(Ac.)
Runoff from this stream =      7.002(CFS)
Time of concentration =   15.22 min.
Rainfall intensity =     2.690(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)      (min)                 (In/Hr)
```

```
1       45.692      9.64                 3.426
2        7.002     15.22                 2.690
Largest stream flow has longer or shorter time of concentration
Qp =     45.692 + sum of
         Qa          Tb/Ta
          7.002 *    0.633 =      4.436
Qp =     50.127

Total of 2 streams to confluence:
Flow rates before confluence point:
      45.692       7.002
Area of streams before confluence:
       14.380        2.890
Results of confluence:
Total flow rate =     50.127(CFS)
Time of concentration =     9.642 min.
Effective stream area after confluence =     17.270(Ac.)


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Process from Point/Station      106.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1548.700(Ft.)
Downstream point/station elevation =  1523.000(Ft.)
Pipe length  =   620.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    50.127(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    50.127(CFS)
Normal flow depth in pipe =   18.19(In.)
Flow top width inside pipe =   25.32(In.)
Critical depth could not be calculated.
Pipe flow velocity =     17.60(Ft/s)
Travel time through pipe =    0.59 min.
Time of concentration (TC) =    10.23 min.


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Process from Point/Station      106.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     17.270(Ac.)
Runoff from this stream =     50.127(CFS)
Time of concentration =   10.23 min.
Rainfall intensity =     3.320(In/Hr)


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Process from Point/Station      110.000 to Point/Station      111.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   530.000(Ft.)
Top (of initial area) elevation =  1540.000(Ft.)
Bottom (of initial area) elevation =  1530.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01887  s(percent)=       1.89
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.312 min.
Rainfall intensity =      2.371(In/Hr) for a   100.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.858
Decimal fraction soil group A = 0.000
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Decimal fraction soil group B = 0.150
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.850
RI index for soil(AMC 3)  =  92.05
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      5.982(CFS)
Total initial stream area =        2.940(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      111.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1523.400(Ft.)
Downstream point/station elevation =  1523.000(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.982(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.982(CFS)
Normal flow depth in pipe =   11.40(In.)
Flow top width inside pipe =   12.81(In.)
Critical Depth =   11.87(In.)
Pipe flow velocity =      5.98(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =    19.42 min.


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Process from Point/Station      111.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.940(Ac.)
Runoff from this stream =      5.982(CFS)
Time of concentration =   19.42 min.
Rainfall intensity =     2.363(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       50.127     10.23                3.320
2        5.982     19.42                2.363
Largest stream flow has longer or shorter time of concentration
Qp =     50.127 + sum of
         Qa          Tb/Ta
          5.982 *    0.527 =      3.150
Qp =     53.278

Total of 2 streams to confluence:
Flow rates before confluence point:
      50.127       5.982
Area of streams before confluence:
       17.270        2.940
Results of confluence:
Total flow rate =     53.278(CFS)
Time of concentration =    10.229 min.
Effective stream area after confluence =     20.210(Ac.)


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Process from Point/Station      109.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
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Upstream point/station elevation =  1523.000(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    53.278(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    53.278(CFS)
Normal flow depth in pipe =   19.22(In.)
Flow top width inside pipe =   19.17(In.)
Critical depth could not be calculated.
Pipe flow velocity =     19.75(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    10.26 min.


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Process from Point/Station      109.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     20.210(Ac.)
Runoff from this stream =     53.278(CFS)
Time of concentration =   10.26 min.
Rainfall intensity =     3.315(In/Hr)


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Process from Point/Station      113.000 to Point/Station      114.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   965.000(Ft.)
Top (of initial area) elevation =  1567.900(Ft.)
Bottom (of initial area) elevation =  1556.000(Ft.)
Difference in elevation =    11.900(Ft.)
Slope =    0.01233  s(percent)=       1.23
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.678 min.
Rainfall intensity =      2.742(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.861
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.400
RI index for soil(AMC 3)  =  83.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      6.677(CFS)
Total initial stream area =        2.830(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      114.000 to Point/Station      115.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of street segment elevation =  1556.000(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   610.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
```

```
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      8.920(CFS)
Depth of flow =   0.362(Ft.), Average velocity =   5.906(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  11.763(Ft.)
Flow velocity =   5.91(Ft/s)
Travel time =    1.72 min.     TC =   16.40  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.847
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 3)  =  79.36
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.585(In/Hr) for a   100.0 year storm
Subarea runoff =      4.400(CFS) for      2.010(Ac.)
Total runoff =     11.077(CFS)   Total area =       4.840(Ac.)
Street flow at end of street =     11.077(CFS)
Half street flow at end of street =     11.077(CFS)
Depth of flow =   0.384(Ft.), Average velocity =   6.216(Ft/s)
Flow width (from curb towards crown)=  12.866(Ft.)


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Process from Point/Station      115.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1521.200(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.077(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.077(CFS)
Normal flow depth in pipe =   13.52(In.)
Flow top width inside pipe =   15.56(In.)
Critical Depth =   15.29(In.)
Pipe flow velocity =      7.78(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    16.46 min.


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Process from Point/Station      115.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.840(Ac.)
Runoff from this stream =     11.077(CFS)
Time of concentration =   16.46 min.
Rainfall intensity =     2.580(In/Hr)


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Process from Point/Station      104.000 to Point/Station      127.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   623.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
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Bottom (of initial area) elevation =  1552.000(Ft.)
Difference in elevation =    20.000(Ft.)
Slope =    0.03210  s(percent)=       3.21
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.175 min.
Rainfall intensity =      3.329(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.847
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      5.017(CFS)
Total initial stream area =        1.780(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      127.000 to Point/Station      128.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1552.000(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   518.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      7.583(CFS)
Depth of flow =   0.346(Ft.), Average velocity =   5.681(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  10.991(Ft.)
Flow velocity =   5.68(Ft/s)
Travel time =    1.52 min.     TC =   11.70  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.855
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 3)  =  79.36
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      3.093(In/Hr) for a   100.0 year storm
Subarea runoff =      5.048(CFS) for      1.910(Ac.)
Total runoff =     10.065(CFS)    Total area =       3.690(Ac.)
Street flow at end of street =     10.065(CFS)
Half street flow at end of street =     10.065(CFS)
Depth of flow =   0.374(Ft.), Average velocity =   6.071(Ft/s)
Flow width (from curb towards crown)=  12.374(Ft.)


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Process from Point/Station      128.000 to Point/Station      112.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1521.200(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    45.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.065(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    10.065(CFS)
Normal flow depth in pipe =   12.62(In.)
Flow top width inside pipe =   20.57(In.)
Critical Depth =   14.17(In.)
Pipe flow velocity =      6.66(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =    11.81 min.


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Process from Point/Station      128.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
_____________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      3.690(Ac.)
Runoff from this stream =     10.065(CFS)
Time of concentration =   11.81 min.
Rainfall intensity =     3.077(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       53.278     10.26                3.315
2       11.077     16.46                2.580
3       10.065     11.81                3.077
Largest stream flow has longer or shorter time of concentration
Qp =     53.278 + sum of
         Qa          Tb/Ta
         11.077 *    0.623 =      6.904
         Qa          Tb/Ta
         10.065 *    0.869 =      8.746
Qp =     68.928

Total of 3 streams to confluence:
Flow rates before confluence point:
      53.278      11.077      10.065
Area of streams before confluence:
       20.210        4.840        3.690
Results of confluence:
Total flow rate =     68.928(CFS)
Time of concentration =    10.261 min.
Effective stream area after confluence =     28.740(Ac.)


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Process from Point/Station      112.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1520.800(Ft.)
Downstream point/station elevation =  1520.000(Ft.)
Pipe length  =    32.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    68.928(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    68.928(CFS)
Normal flow depth in pipe =   26.81(In.)
Flow top width inside pipe =   18.49(In.)
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Critical depth could not be calculated.
Pipe flow velocity =     14.89(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    10.30 min.


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Process from Point/Station      112.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     28.740(Ac.)
Runoff from this stream =     68.928(CFS)
Time of concentration =   10.30 min.
Rainfall intensity =     3.309(In/Hr)


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Process from Point/Station      117.000 to Point/Station      118.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   500.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1539.300(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.00900  s(percent)=       0.90
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.017 min.
Rainfall intensity =      3.048(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.861
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  82.30
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.337(CFS)
Total initial stream area =        0.890(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      118.000 to Point/Station      119.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of street segment elevation =  1539.300(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   933.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      4.180(CFS)
Depth of flow =   0.358(Ft.), Average velocity =   2.850(Ft/s)
Streetflow hydraulics at midpoint of street travel:
```

```
Halfstreet flow width =  11.576(Ft.)
Flow velocity =   2.85(Ft/s)
Travel time =    5.46 min.     TC =   17.47  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.700
RI index for soil(AMC 3)  =  84.58
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.500(In/Hr) for a   100.0 year storm
Subarea runoff =      3.634(CFS) for      1.690(Ac.)
Total runoff =      5.970(CFS)   Total area =       2.580(Ac.)
Street flow at end of street =      5.970(CFS)
Half street flow at end of street =      5.970(CFS)
Depth of flow =   0.395(Ft.), Average velocity =   3.101(Ft/s)
Flow width (from curb towards crown)=  13.412(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1521.400(Ft.)
Downstream point/station elevation =  1520.000(Ft.)
Pipe length  =    57.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.970(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.970(CFS)
Normal flow depth in pipe =    8.29(In.)
Flow top width inside pipe =   14.92(In.)
Critical Depth =   11.86(In.)
Pipe flow velocity =      8.59(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =    17.58 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.580(Ac.)
Runoff from this stream =      5.970(CFS)
Time of concentration =   17.58 min.
Rainfall intensity =     2.491(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       68.928     10.30                3.309
2        5.970     17.58                2.491
Largest stream flow has longer or shorter time of concentration
Qp =     68.928 + sum of
         Qa          Tb/Ta
          5.970 *    0.586 =      3.496
Qp =     72.424

Total of 2 streams to confluence:
Flow rates before confluence point:
      68.928       5.970
```

```
Area of streams before confluence:
       28.740        2.580
Results of confluence:
Total flow rate =     72.424(CFS)
Time of concentration =    10.297 min.
Effective stream area after confluence =     31.320(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      116.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1520.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    72.424(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    72.424(CFS)
Normal flow depth in pipe =   29.25(In.)
Flow top width inside pipe =   33.77(In.)
Critical Depth =   32.36(In.)
Pipe flow velocity =     10.86(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    10.38 min.


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Process from Point/Station      116.000 to Point/Station      120.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     31.320(Ac.)
Runoff from this stream =     72.424(CFS)
Time of concentration =   10.38 min.
Rainfall intensity =     3.294(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      121.000 to Point/Station      122.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   193.000(Ft.)
Top (of initial area) elevation =  1546.000(Ft.)
Bottom (of initial area) elevation =  1544.700(Ft.)
Difference in elevation =     1.300(Ft.)
Slope =    0.00674  s(percent)=       0.67
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.702 min.
Rainfall intensity =      3.617(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.878
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 3)  =  88.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.082(CFS)
Total initial stream area =        0.970(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      122.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1537.700(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =   496.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.082(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.082(CFS)
Normal flow depth in pipe =    8.02(In.)
Flow top width inside pipe =   11.30(In.)
Critical Depth =    9.03(In.)
Pipe flow velocity =      5.53(Ft/s)
Travel time through pipe =    1.50 min.
Time of concentration (TC) =    10.20 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      122.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.970(Ac.)
Runoff from this stream =      3.082(CFS)
Time of concentration =   10.20 min.
Rainfall intensity =     3.325(In/Hr)


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Process from Point/Station      124.000 to Point/Station      125.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   960.000(Ft.)
Top (of initial area) elevation =  1549.500(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =    10.500(Ft.)
Slope =    0.01094  s(percent)=       1.09
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.003 min.
Rainfall intensity =      2.710(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.860
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.600
RI index for soil(AMC 3)  =  83.44
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =     10.697(CFS)
Total initial stream area =        4.590(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      125.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =    26.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.697(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.697(CFS)
Normal flow depth in pipe =   13.97(In.)
Flow top width inside pipe =   15.01(In.)
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Critical Depth =   15.06(In.)
Pipe flow velocity =      7.26(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    15.06 min.


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Process from Point/Station      125.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      4.590(Ac.)
Runoff from this stream =     10.697(CFS)
Time of concentration =   15.06 min.
Rainfall intensity =     2.704(In/Hr)


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Process from Point/Station      124.000 to Point/Station      126.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1549.500(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =    10.500(Ft.)
Slope =    0.01050  s(percent)=       1.05
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.375 min.
Rainfall intensity =      2.675(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.863
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.700
RI index for soil(AMC 3)  =  84.58
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =     11.537(CFS)
Total initial stream area =        5.000(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      126.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.537(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.537(CFS)
Normal flow depth in pipe =   13.31(In.)
Flow top width inside pipe =   15.80(In.)
Critical Depth =   15.54(In.)
Pipe flow velocity =      8.24(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    15.42 min.


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Process from Point/Station      126.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
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Stream flow area =      5.000(Ac.)
Runoff from this stream =     11.537(CFS)
Time of concentration =   15.42 min.
Rainfall intensity =     2.671(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        3.082     10.20                 3.325
2       10.697     15.06                 2.704
3       11.537     15.42                 2.671
Largest stream flow has longer time of concentration
Qp =     11.537 + sum of
         Qb         Ia/Ib
          3.082 *    0.803 =      2.476
         Qb         Ia/Ib
         10.697 *    0.988 =     10.567
Qp =     24.580

Total of 3 streams to confluence:
Flow rates before confluence point:
       3.082      10.697      11.537
Area of streams before confluence:
        0.970        4.590        5.000
Results of confluence:
Total flow rate =     24.580(CFS)
Time of concentration =    15.416 min.
Effective stream area after confluence =     10.560(Ac.)


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Process from Point/Station      123.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1531.700(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =   800.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    24.580(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    24.580(CFS)
Normal flow depth in pipe =   17.46(In.)
Flow top width inside pipe =   21.37(In.)
Critical Depth =   21.02(In.)
Pipe flow velocity =     10.03(Ft/s)
Travel time through pipe =    1.33 min.
Time of concentration (TC) =    16.74 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station      120.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     10.560(Ac.)
Runoff from this stream =     24.580(CFS)
Time of concentration =   16.74 min.
Rainfall intensity =     2.557(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1       72.424     10.38           3.294
2       24.580     16.74           2.557
Largest stream flow has longer or shorter time of concentration
Qp =     72.424 + sum of
         Qa          Tb/Ta
         24.580 *    0.620 =     15.236
Qp =     87.660

Total of 2 main streams to confluence:
Flow rates before confluence point:
      72.424      24.580
Area of streams before confluence:
       31.320       10.560


Results of confluence:
Total flow rate =     87.660(CFS)
Time of concentration =    10.380 min.
Effective stream area after confluence  =     41.880(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      128.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1519.500(Ft.)
Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =  1360.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    87.660(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    87.660(CFS)
Normal flow depth in pipe =   34.13(In.)
Flow top width inside pipe =   32.79(In.)
Critical Depth =   34.95(In.)
Pipe flow velocity =     10.48(Ft/s)
Travel time through pipe =    2.16 min.
Time of concentration (TC) =    12.54 min.


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Process from Point/Station      120.000 to Point/Station      128.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     41.880(Ac.)
Runoff from this stream =     87.660(CFS)
Time of concentration =   12.54 min.
Rainfall intensity =     2.980(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      158.000 to Point/Station      159.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   245.000(Ft.)
Top (of initial area) elevation =  1720.000(Ft.)
Bottom (of initial area) elevation =  1659.000(Ft.)
Difference in elevation =    61.000(Ft.)
Slope =    0.24898  s(percent)=      24.90
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.320 min.
Rainfall intensity =      4.285(In/Hr) for a   100.0 year storm
```

```
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.869
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      4.135(CFS)
Total initial stream area =        1.110(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      158.000 to Point/Station      159.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.891
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     6.32 min.
Rainfall intensity =      4.285(In/Hr) for a   100.0 year storm
Subarea runoff =      1.566(CFS) for      0.410(Ac.)
Total runoff =      5.701(CFS)   Total area =       1.520(Ac.)


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Process from Point/Station      158.000 to Point/Station      159.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.891
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     6.32 min.
Rainfall intensity =      4.285(In/Hr) for a   100.0 year storm
Subarea runoff =      2.712(CFS) for      0.710(Ac.)
Total runoff =      8.414(CFS)   Total area =       2.230(Ac.)


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Process from Point/Station      160.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1650.000(Ft.)
Downstream point/station elevation =  1512.000(Ft.)
Pipe length  =   965.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.414(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     8.414(CFS)
Normal flow depth in pipe =    6.87(In.)
Flow top width inside pipe =   11.87(In.)
Critical depth could not be calculated.
Pipe flow velocity =     18.09(Ft/s)
Travel time through pipe =    0.89 min.
Time of concentration (TC) =     7.21 min.
```

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Process from Point/Station      160.000 to Point/Station      161.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      2.230(Ac.)
Runoff from this stream =      8.414(CFS)
Time of concentration =    7.21 min.
Rainfall intensity =     3.997(In/Hr)


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Process from Point/Station      162.000 to Point/Station      163.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   945.000(Ft.)
Top (of initial area) elevation =  1717.700(Ft.)
Bottom (of initial area) elevation =  1520.000(Ft.)
Difference in elevation =   197.700(Ft.)
Slope =    0.20921  s(percent)=      20.92
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.229 min.
Rainfall intensity =      3.160(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.865
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  91.24
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     12.682(CFS)
Total initial stream area =        4.640(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      163.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1513.000(Ft.)
Downstream point/station elevation =  1512.000(Ft.)
Pipe length  =    23.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.682(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    12.682(CFS)
Normal flow depth in pipe =   11.58(In.)
Flow top width inside pipe =   12.59(In.)
Critical depth could not be calculated.
Pipe flow velocity =     12.48(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    11.26 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      163.000 to Point/Station      161.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      4.640(Ac.)
Runoff from this stream =     12.682(CFS)
Time of concentration =   11.26 min.
Rainfall intensity =     3.155(In/Hr)
```

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Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        8.414      7.21                 3.997
2       12.682     11.26                 3.155
Largest stream flow has longer time of concentration
Qp =     12.682 + sum of
         Qb         Ia/Ib
          8.414 *    0.790 =      6.643
Qp =     19.325

Total of 2 streams to confluence:
Flow rates before confluence point:
       8.414      12.682
Area of streams before confluence:
        2.230        4.640
Results of confluence:
Total flow rate =     19.325(CFS)
Time of concentration =    11.260 min.
Effective stream area after confluence =      6.870(Ac.)


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Process from Point/Station      163.000 to Point/Station      161.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.861
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  90.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    11.26 min.
Rainfall intensity =      3.155(In/Hr) for a   100.0 year storm
Subarea runoff =      1.631(CFS) for      0.600(Ac.)
Total runoff =     20.956(CFS)   Total area =       7.470(Ac.)


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Process from Point/Station      161.000 to Point/Station      128.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1512.000(Ft.)
Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =   567.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.956(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    20.956(CFS)
Normal flow depth in pipe =   20.63(In.)
Flow top width inside pipe =   22.93(In.)
Critical Depth =   19.22(In.)
Pipe flow velocity =      6.44(Ft/s)
Travel time through pipe =    1.47 min.
Time of concentration (TC) =    12.73 min.


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Process from Point/Station      161.000 to Point/Station      128.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
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The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      7.470(Ac.)
Runoff from this stream =     20.956(CFS)
Time of concentration =   12.73 min.
Rainfall intensity =     2.957(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       87.660     12.54           2.980
2       20.956     12.73           2.957
Largest stream flow has longer or shorter time of concentration
Qp =     87.660 + sum of
         Qa          Tb/Ta
         20.956 *    0.986 =     20.652
Qp =    108.312

Total of 2 main streams to confluence:
Flow rates before confluence point:
      87.660      20.956
Area of streams before confluence:
       41.880        7.470


Results of confluence:
Total flow rate =    108.312(CFS)
Time of concentration =    12.543 min.
Effective stream area after confluence  =     49.350(Ac.)


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Process from Point/Station      128.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1509.000(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =   333.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   108.312(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =   108.312(CFS)
Normal flow depth in pipe =   27.80(In.)
Flow top width inside pipe =   30.20(In.)
Critical depth could not be calculated.
Pipe flow velocity =     18.50(Ft/s)
Travel time through pipe =    0.30 min.
Time of concentration (TC) =    12.84 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      128.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     49.350(Ac.)
Runoff from this stream =    108.312(CFS)
Time of concentration =   12.84 min.
Rainfall intensity =     2.943(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      130.000 to Point/Station      131.000
**** INITIAL AREA EVALUATION ****
```

```
Initial area flow distance =   994.000(Ft.)
Top (of initial area) elevation =  1521.000(Ft.)
Bottom (of initial area) elevation =  1508.600(Ft.)
Difference in elevation =    12.400(Ft.)
Slope =    0.01247  s(percent)=       1.25
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.819 min.
Rainfall intensity =      2.728(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 3)  =  79.36
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      5.421(CFS)
Total initial stream area =        2.340(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      131.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1499.400(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =    22.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.421(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.421(CFS)
Normal flow depth in pipe =    9.41(In.)
Flow top width inside pipe =   14.51(In.)
Critical Depth =   11.32(In.)
Pipe flow velocity =      6.69(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    14.87 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      131.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.340(Ac.)
Runoff from this stream =      5.421(CFS)
Time of concentration =   14.87 min.
Rainfall intensity =     2.723(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      132.000 to Point/Station      133.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   636.000(Ft.)
Top (of initial area) elevation =  1526.500(Ft.)
Bottom (of initial area) elevation =  1519.100(Ft.)
Difference in elevation =     7.400(Ft.)
Slope =    0.01164  s(percent)=       1.16
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.569 min.
Rainfall intensity =      2.977(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.874
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 3)  =  88.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.539(CFS)
Total initial stream area =        1.360(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      133.000 to Point/Station      134.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1519.100(Ft.)
End of street segment elevation =  1510.100(Ft.)
Length of street segment  =   806.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     11.066(CFS)
Depth of flow =   0.464(Ft.), Average velocity =   3.726(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  16.862(Ft.)
Flow velocity =   3.73(Ft/s)
Travel time =    3.61 min.     TC =   16.17  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.855
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  82.30
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.604(In/Hr) for a   100.0 year storm
Subarea runoff =     14.970(CFS) for      6.720(Ac.)
Total runoff =     18.508(CFS)   Total area =       8.080(Ac.)
Street flow at end of street =     18.508(CFS)
Half street flow at end of street =     18.508(CFS)
Depth of flow =   0.537(Ft.), Average velocity =   4.290(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    1.87(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station      134.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1499.400(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
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```
No. of pipes = 1  Required pipe flow  =    18.508(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    18.508(CFS)
Normal flow depth in pipe =   18.90(In.)
Flow top width inside pipe =   12.60(In.)
Critical Depth =   18.72(In.)
Pipe flow velocity =      8.11(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    16.23 min.


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Process from Point/Station      134.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      8.080(Ac.)
Runoff from this stream =     18.508(CFS)
Time of concentration =   16.23 min.
Rainfall intensity =     2.600(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1      108.312     12.84                2.943
2        5.421     14.87                2.723
3       18.508     16.23                2.600
Largest stream flow has longer or shorter time of concentration
Qp =    108.312 + sum of
         Qa          Tb/Ta
          5.421 *    0.864 =      4.681
         Qa          Tb/Ta
         18.508 *    0.792 =     14.650
Qp =    127.643

Total of 3 streams to confluence:
Flow rates before confluence point:
     108.312       5.421      18.508
Area of streams before confluence:
       49.350        2.340        8.080
Results of confluence:
Total flow rate =    127.643(CFS)
Time of concentration =    12.843 min.
Effective stream area after confluence =     59.770(Ac.)


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Process from Point/Station      129.000 to Point/Station      135.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1499.100(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =   107.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   127.643(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =   127.643(CFS)
Normal flow depth in pipe =   38.81(In.)
Flow top width inside pipe =   30.99(In.)
Critical Depth =   40.46(In.)
Pipe flow velocity =     12.60(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =    12.98 min.
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      129.000 to Point/Station      135.100
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     59.770(Ac.)
Runoff from this stream =    127.643(CFS)
Time of concentration =   12.98 min.
Rainfall intensity =     2.926(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      136.000 to Point/Station      137.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   616.000(Ft.)
Top (of initial area) elevation =  1515.100(Ft.)
Bottom (of initial area) elevation =  1506.700(Ft.)
Difference in elevation =     8.400(Ft.)
Slope =    0.01364  s(percent)=       1.36
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.021 min.
Rainfall intensity =      3.048(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.771
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  52.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      4.204(CFS)
Total initial stream area =        1.790(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      137.000 to Point/Station      138.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1498.900(Ft.)
Downstream point/station elevation =  1498.400(Ft.)
Pipe length  =    47.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.204(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     4.204(CFS)
Normal flow depth in pipe =    8.65(In.)
Flow top width inside pipe =   14.82(In.)
Critical Depth =    9.96(In.)
Pipe flow velocity =      5.74(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =    12.16 min.


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Process from Point/Station      137.000 to Point/Station      138.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      1.790(Ac.)
Runoff from this stream =      4.204(CFS)
Time of concentration =   12.16 min.
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Rainfall intensity =     3.030(In/Hr)


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Process from Point/Station      139.000 to Point/Station      140.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   701.000(Ft.)
Top (of initial area) elevation =  1512.200(Ft.)
Bottom (of initial area) elevation =  1506.700(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.00785  s(percent)=       0.78
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.139 min.
Rainfall intensity =      2.797(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.838
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      5.529(CFS)
Total initial stream area =        2.360(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      140.000 to Point/Station      138.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1498.600(Ft.)
Downstream point/station elevation =  1498.400(Ft.)
Pipe length  =    10.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.529(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.529(CFS)
Normal flow depth in pipe =    8.42(In.)
Flow top width inside pipe =   14.89(In.)
Critical Depth =   11.43(In.)
Pipe flow velocity =      7.80(Ft/s)
Travel time through pipe =    0.02 min.
Time of concentration (TC) =    14.16 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      140.000 to Point/Station      138.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      2.360(Ac.)
Runoff from this stream =      5.529(CFS)
Time of concentration =   14.16 min.
Rainfall intensity =     2.794(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        4.204     12.16                3.030
2        5.529     14.16                2.794
Largest stream flow has longer time of concentration
Qp =      5.529 + sum of
```

```
          Qb         Ia/Ib
           4.204 *    0.922 =      3.877
Qp =       9.407

Total of 2 streams to confluence:
Flow rates before confluence point:
       4.204       5.529
Area of streams before confluence:
        1.790        2.360
Results of confluence:
Total flow rate =      9.407(CFS)
Time of concentration =    14.161 min.
Effective stream area after confluence =      4.150(Ac.)


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Process from Point/Station      138.000 to Point/Station      135.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.400(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.407(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     9.407(CFS)
Normal flow depth in pipe =   13.29(In.)
Flow top width inside pipe =   15.82(In.)
Critical Depth =   14.22(In.)
Pipe flow velocity =      6.72(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =    14.26 min.


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Process from Point/Station      138.000 to Point/Station      135.200
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      4.150(Ac.)
Runoff from this stream =      9.407(CFS)
Time of concentration =   14.26 min.
Rainfall intensity =     2.784(In/Hr)
Program is now starting with Main Stream No. 3


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Process from Point/Station      146.000 to Point/Station      147.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1744.000(Ft.)
Bottom (of initial area) elevation =  1579.000(Ft.)
Difference in elevation =   165.000(Ft.)
Slope =    0.16500  s(percent)=      16.50
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.044 min.
Rainfall intensity =      3.045(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.857
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
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Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     11.147(CFS)
Total initial stream area =        4.270(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      147.000 to Point/Station      148.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =  1579.000(Ft.)
Downstream point elevation =  1568.000(Ft.)
Channel length thru subarea  =   185.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =     12.138(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =     12.138(CFS)
Depth of flow =   0.950(Ft.), Average velocity =  13.463(Ft/s)
Channel flow top width =    1.899(Ft.)
Flow Velocity =   13.46(Ft/s)
Travel time  =    0.23 min.
Time of concentration =   12.27 min.

Sub-Channel No. 1 Critical depth =      1.547(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    5.078(Ft/s)
  '     '       '     Critical flow area =      2.391(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.832
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  84.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      3.014(In/Hr) for a   100.0 year storm
Subarea runoff =      1.906(CFS) for      0.760(Ac.)
Total runoff =     13.053(CFS)   Total area =       5.030(Ac.)
Depth of flow =   0.976(Ft.), Average velocity =  13.710(Ft/s)

Sub-Channel No. 1 Critical depth =      1.586(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    5.205(Ft/s)
  '     '       '     Critical flow area =      2.508(Sq.Ft)



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Process from Point/Station      147.000 to Point/Station      148.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.857
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    12.27 min.
```

```
Rainfall intensity =      3.014(In/Hr) for a   100.0 year storm
Subarea runoff =      6.200(CFS) for      2.400(Ac.)
Total runoff =     19.252(CFS)    Total area =       7.430(Ac.)


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Process from Point/Station      148.000 to Point/Station      149.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =  1568.000(Ft.)
Downstream point elevation =  1560.000(Ft.)
Channel length thru subarea  =   220.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =     19.771(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =     19.771(CFS)
Depth of flow =   1.250(Ft.), Average velocity =  12.649(Ft/s)
Channel flow top width =    2.500(Ft.)
Flow Velocity =   12.65(Ft/s)
Travel time  =    0.29 min.
Time of concentration =   12.56 min.

Sub-Channel No. 1 Critical depth =      1.859(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    5.940(Ft/s)
  '     '       '     Critical flow area =      3.328(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.831
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  84.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.977(In/Hr) for a   100.0 year storm
Subarea runoff =      0.990(CFS) for      0.400(Ac.)
Total runoff =     20.242(CFS)    Total area =       7.830(Ac.)
Depth of flow =   1.261(Ft.), Average velocity =  12.723(Ft/s)

Sub-Channel No. 1 Critical depth =      1.875(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    5.998(Ft/s)
  '     '       '     Critical flow area =      3.375(Sq.Ft)



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Process from Point/Station      149.000 to Point/Station      150.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =  1560.000(Ft.)
Downstream point elevation =  1555.000(Ft.)
Channel length thru subarea  =   190.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =     21.512(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =     21.512(CFS)
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Depth of flow =   1.371(Ft.), Average velocity =  11.443(Ft/s)
Channel flow top width =    2.742(Ft.)
Flow Velocity =   11.44(Ft/s)
Travel time  =    0.28 min.
Time of concentration =   12.84 min.

Sub-Channel No. 1 Critical depth =      1.922(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    6.119(Ft/s)
  '     '       '     Critical flow area =      3.516(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.830
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  84.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.943(In/Hr) for a   100.0 year storm
Subarea runoff =      2.469(CFS) for      1.010(Ac.)
Total runoff =     22.711(CFS)   Total area =       8.840(Ac.)
Depth of flow =   1.399(Ft.), Average velocity =  11.599(Ft/s)

Sub-Channel No. 1 Critical depth =      1.969(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    6.212(Ft/s)
  '     '       '     Critical flow area =      3.656(Sq.Ft)



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Process from Point/Station      149.000 to Point/Station      150.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.856
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    12.84 min.
Rainfall intensity =      2.943(In/Hr) for a   100.0 year storm
Subarea runoff =      8.566(CFS) for      3.400(Ac.)
Total runoff =     31.277(CFS)   Total area =      12.240(Ac.)


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Process from Point/Station      150.000 to Point/Station      151.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________
Upstream point elevation =  1555.000(Ft.)
Downstream point elevation =  1536.000(Ft.)
Channel length thru subarea  =   330.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =     31.915(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =     31.915(CFS)
Depth of flow =   1.373(Ft.), Average velocity =  16.938(Ft/s)
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Channel flow top width =    2.745(Ft.)
Flow Velocity =   16.94(Ft/s)
Travel time  =    0.32 min.
Time of concentration =   13.16 min.

Sub-Channel No. 1 Critical depth =      2.266(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    7.019(Ft/s)
  '     '       '     Critical flow area =      4.547(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.830
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  84.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.905(In/Hr) for a   100.0 year storm
Subarea runoff =      1.205(CFS) for      0.500(Ac.)
Total runoff =     32.481(CFS)   Total area =      12.740(Ac.)
Depth of flow =   1.382(Ft.), Average velocity =  17.013(Ft/s)

Sub-Channel No. 1 Critical depth =      2.281(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    7.071(Ft/s)
  '     '       '     Critical flow area =      4.594(Sq.Ft)



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Process from Point/Station      151.000 to Point/Station      152.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1534.000(Ft.)
Downstream point/station elevation =  1533.000(Ft.)
Pipe length  =   104.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    32.481(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    32.481(CFS)
Normal flow depth in pipe =   20.44(In.)
Flow top width inside pipe =   27.96(In.)
Critical Depth =   23.27(In.)
Pipe flow velocity =      9.12(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    13.35 min.


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Process from Point/Station      151.000 to Point/Station      152.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     12.740(Ac.)
Runoff from this stream =     32.481(CFS)
Time of concentration =   13.35 min.
Rainfall intensity =     2.883(In/Hr)


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Process from Point/Station      153.000 to Point/Station      152.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   727.000(Ft.)
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Top (of initial area) elevation =  1707.000(Ft.)
Bottom (of initial area) elevation =  1537.000(Ft.)
Difference in elevation =   170.000(Ft.)
Slope =    0.23384  s(percent)=      23.38
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.888 min.
Rainfall intensity =      3.380(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  93.10
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     10.050(CFS)
Total initial stream area =        3.400(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      153.000 to Point/Station      152.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      3.400(Ac.)
Runoff from this stream =     10.050(CFS)
Time of concentration =    9.89 min.
Rainfall intensity =     3.380(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       32.481     13.35                2.883
2       10.050      9.89                3.380
Largest stream flow has longer time of concentration
Qp =     32.481 + sum of
         Qb         Ia/Ib
         10.050 *    0.853 =      8.570
Qp =     41.052

Total of 2 streams to confluence:
Flow rates before confluence point:
      32.481      10.050
Area of streams before confluence:
       12.740        3.400
Results of confluence:
Total flow rate =     41.052(CFS)
Time of concentration =    13.355 min.
Effective stream area after confluence =     16.140(Ac.)


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Process from Point/Station      152.000 to Point/Station      154.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =   440.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    41.052(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    41.052(CFS)
Normal flow depth in pipe =   20.53(In.)
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Flow top width inside pipe =   16.88(In.)
Critical depth could not be calculated.
Pipe flow velocity =     14.34(Ft/s)
Travel time through pipe =    0.51 min.
Time of concentration (TC) =    13.87 min.


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Process from Point/Station      152.000 to Point/Station      154.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     16.140(Ac.)
Runoff from this stream =     41.052(CFS)
Time of concentration =   13.87 min.
Rainfall intensity =     2.826(In/Hr)


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Process from Point/Station      155.000 to Point/Station      156.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   320.000(Ft.)
Top (of initial area) elevation =  1575.000(Ft.)
Bottom (of initial area) elevation =  1528.000(Ft.)
Difference in elevation =    47.000(Ft.)
Slope =    0.14688  s(percent)=      14.69
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.470 min.
Rainfall intensity =      3.279(In/Hr) for a   100.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.875
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 3)  =  93.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.578(CFS)
Total initial stream area =        0.550(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      156.000 to Point/Station      154.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1528.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =    36.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.578(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     1.578(CFS)
Normal flow depth in pipe =    3.28(In.)
Flow top width inside pipe =    5.97(In.)
Critical depth could not be calculated.
Pipe flow velocity =     14.39(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    10.51 min.


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Process from Point/Station      156.000 to Point/Station      154.000
**** CONFLUENCE OF MINOR STREAMS ****
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Along Main Stream number: 3 in normal stream number 2
Stream flow area =      0.550(Ac.)
Runoff from this stream =      1.578(CFS)
Time of concentration =   10.51 min.
Rainfall intensity =     3.273(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       41.052     13.87                2.826
2        1.578     10.51                3.273
Largest stream flow has longer time of concentration
Qp =     41.052 + sum of
         Qb         Ia/Ib
          1.578 *    0.863 =      1.363
Qp =     42.414

Total of 2 streams to confluence:
Flow rates before confluence point:
      41.052       1.578
Area of streams before confluence:
       16.140        0.550
Results of confluence:
Total flow rate =     42.414(CFS)
Time of concentration =    13.866 min.
Effective stream area after confluence =     16.690(Ac.)


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Process from Point/Station      154.000 to Point/Station      157.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1519.500(Ft.)
Downstream point/station elevation =  1509.800(Ft.)
Pipe length  =   660.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    42.414(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    42.414(CFS)
Normal flow depth in pipe =   21.30(In.)
Flow top width inside pipe =   27.22(In.)
Critical Depth =   26.13(In.)
Pipe flow velocity =     11.38(Ft/s)
Travel time through pipe =    0.97 min.
Time of concentration (TC) =    14.83 min.


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Process from Point/Station      154.000 to Point/Station      157.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     16.690(Ac.)
Runoff from this stream =     42.414(CFS)
Time of concentration =   14.83 min.
Rainfall intensity =     2.727(In/Hr)


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Process from Point/Station      158.000 to Point/Station      159.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   442.000(Ft.)
Top (of initial area) elevation =  1640.000(Ft.)
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Bottom (of initial area) elevation =  1535.000(Ft.)
Difference in elevation =   105.000(Ft.)
Slope =    0.23756  s(percent)=      23.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.078 min.
Rainfall intensity =      3.763(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  94.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      6.799(CFS)
Total initial stream area =        2.050(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      159.000 to Point/Station      157.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1509.800(Ft.)
Pipe length  =    65.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.799(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     6.799(CFS)
Normal flow depth in pipe =    5.48(In.)
Flow top width inside pipe =    8.78(In.)
Critical depth could not be calculated.
Pipe flow velocity =     24.12(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     8.12 min.


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Process from Point/Station      159.000 to Point/Station      157.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      2.050(Ac.)
Runoff from this stream =      6.799(CFS)
Time of concentration =    8.12 min.
Rainfall intensity =     3.752(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       42.414     14.83                2.727
2        6.799      8.12                3.752
Largest stream flow has longer time of concentration
Qp =     42.414 + sum of
         Qb         Ia/Ib
          6.799 *    0.727 =      4.941
Qp =     47.355

Total of 2 streams to confluence:
Flow rates before confluence point:
      42.414       6.799
Area of streams before confluence:
       16.690        2.050
```

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Results of confluence:
Total flow rate =     47.355(CFS)
Time of concentration =    14.833 min.
Effective stream area after confluence =     18.740(Ac.)


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Process from Point/Station      157.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1509.800(Ft.)
Downstream point/station elevation =  1503.800(Ft.)
Pipe length  =   307.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    47.355(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    47.355(CFS)
Normal flow depth in pipe =   20.79(In.)
Flow top width inside pipe =   27.68(In.)
Critical Depth =   27.16(In.)
Pipe flow velocity =     13.05(Ft/s)
Travel time through pipe =    0.39 min.
Time of concentration (TC) =    15.23 min.


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Process from Point/Station      157.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     18.740(Ac.)
Runoff from this stream =     47.355(CFS)
Time of concentration =   15.23 min.
Rainfall intensity =     2.689(In/Hr)


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Process from Point/Station      161.000 to Point/Station      162.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   570.000(Ft.)
Top (of initial area) elevation =  1630.000(Ft.)
Bottom (of initial area) elevation =  1535.000(Ft.)
Difference in elevation =    95.000(Ft.)
Slope =    0.16667  s(percent)=      16.67
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.600 min.
Rainfall intensity =      3.434(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.875
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  93.10
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      4.987(CFS)
Total initial stream area =        1.660(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      162.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.000(Ft.)
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Downstream point/station elevation =  1503.800(Ft.)
Pipe length  =    72.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.987(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     4.987(CFS)
Normal flow depth in pipe =    4.36(In.)
Flow top width inside pipe =    9.00(In.)
Critical depth could not be calculated.
Pipe flow velocity =     23.52(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =     9.65 min.


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Process from Point/Station      162.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      1.660(Ac.)
Runoff from this stream =      4.987(CFS)
Time of concentration =    9.65 min.
Rainfall intensity =     3.424(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       47.355     15.23                2.689
2        4.987      9.65                3.424
Largest stream flow has longer time of concentration
Qp =     47.355 + sum of
         Qb         Ia/Ib
          4.987 *    0.785 =      3.916
Qp =     51.272

Total of 2 streams to confluence:
Flow rates before confluence point:
      47.355       4.987
Area of streams before confluence:
       18.740        1.660
Results of confluence:
Total flow rate =     51.272(CFS)
Time of concentration =    15.225 min.
Effective stream area after confluence =     20.400(Ac.)


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Process from Point/Station      160.000 to Point/Station      135.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1503.800(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =   256.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    51.272(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    51.272(CFS)
Normal flow depth in pipe =   20.86(In.)
Flow top width inside pipe =   27.62(In.)
Critical Depth =   27.77(In.)
Pipe flow velocity =     14.06(Ft/s)
Travel time through pipe =    0.30 min.
Time of concentration (TC) =    15.53 min.
```

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Process from Point/Station      160.000 to Point/Station      135.200
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =     20.400(Ac.)
Runoff from this stream =     51.272(CFS)
Time of concentration =   15.53 min.
Rainfall intensity =     2.661(In/Hr)
Program is now starting with Main Stream No. 4


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Process from Point/Station      128.000 to Point/Station      140.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   580.000(Ft.)
Top (of initial area) elevation =  1529.800(Ft.)
Bottom (of initial area) elevation =  1523.300(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.01121  s(percent)=       1.12
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.205 min.
Rainfall intensity =      3.023(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 3)  =  88.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.437(CFS)
Total initial stream area =        1.300(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      140.000 to Point/Station      141.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of street segment elevation =  1523.300(Ft.)
End of street segment elevation =  1504.000(Ft.)
Length of street segment  =  1420.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      6.701(CFS)
Depth of flow =   0.392(Ft.), Average velocity =   3.558(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.255(Ft.)
Flow velocity =   3.56(Ft/s)
Travel time =    6.65 min.     TC =   18.86  min.
 Adding area flow to street
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SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.852
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  82.30
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.401(In/Hr) for a   100.0 year storm
Subarea runoff =      6.464(CFS) for      3.160(Ac.)
Total runoff =      9.901(CFS)   Total area =       4.460(Ac.)
Street flow at end of street =      9.901(CFS)
Half street flow at end of street =      9.901(CFS)
Depth of flow =   0.437(Ft.), Average velocity =   3.907(Ft/s)
Flow width (from curb towards crown)=  15.516(Ft.)


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Process from Point/Station      141.000 to Point/Station      142.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1498.800(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =    70.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.901(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     9.901(CFS)
Normal flow depth in pipe =   13.13(In.)
Flow top width inside pipe =   16.00(In.)
Critical Depth =   14.55(In.)
Pipe flow velocity =      7.17(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    19.02 min.


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Process from Point/Station      141.000 to Point/Station      142.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 4 in normal stream number 1
Stream flow area =      4.460(Ac.)
Runoff from this stream =      9.901(CFS)
Time of concentration =   19.02 min.
Rainfall intensity =     2.390(In/Hr)


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Process from Point/Station      117.000 to Point/Station      143.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   722.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1537.300(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.00900  s(percent)=       0.90
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.919 min.
Rainfall intensity =      2.820(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.858
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  82.30
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Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.784(CFS)
Total initial stream area =        1.150(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      143.000 to Point/Station      144.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1537.300(Ft.)
End of street segment elevation =  1528.600(Ft.)
Length of street segment  =   863.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      4.169(CFS)
Depth of flow =   0.358(Ft.), Average velocity =   2.837(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  11.587(Ft.)
Flow velocity =   2.84(Ft/s)
Travel time =    5.07 min.     TC =   18.99  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.865
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.100
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.900
RI index for soil(AMC 3)  =  86.86
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.392(In/Hr) for a   100.0 year storm
Subarea runoff =      2.711(CFS) for      1.310(Ac.)
Total runoff =      5.495(CFS)   Total area =       2.460(Ac.)
Street flow at end of street =      5.495(CFS)
Half street flow at end of street =      5.495(CFS)
Depth of flow =   0.386(Ft.), Average velocity =   3.028(Ft/s)
Flow width (from curb towards crown)=  12.991(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      144.000 to Point/Station      145.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1528.600(Ft.)
End of street segment elevation =  1498.100(Ft.)
Length of street segment  =  1850.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
```

```
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      7.919(CFS)
Depth of flow =   0.399(Ft.), Average velocity =   3.985(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.641(Ft.)
Flow velocity =   3.98(Ft/s)
Travel time =    7.74 min.     TC =   26.73  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.843
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  82.30
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.996(In/Hr) for a   100.0 year storm
Subarea runoff =      4.797(CFS) for      2.850(Ac.)
Total runoff =     10.292(CFS)   Total area =       5.310(Ac.)
Street flow at end of street =     10.292(CFS)
Half street flow at end of street =     10.292(CFS)
Depth of flow =   0.430(Ft.), Average velocity =   4.243(Ft/s)
Flow width (from curb towards crown)=  15.161(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      145.000 to Point/Station      142.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.600(Ft.)
Downstream point/station elevation =  1498.100(Ft.)
Pipe length  =    50.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.292(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.292(CFS)
Normal flow depth in pipe =   14.44(In.)
Flow top width inside pipe =   14.34(In.)
Critical Depth =   14.81(In.)
Pipe flow velocity =      6.78(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    26.85 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      145.000 to Point/Station      142.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 4 in normal stream number 2
Stream flow area =      5.310(Ac.)
Runoff from this stream =     10.292(CFS)
Time of concentration =   26.85 min.
Rainfall intensity =     1.991(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        9.901     19.02                2.390
2       10.292     26.85                1.991
Largest stream flow has longer time of concentration
```

```
Qp =     10.292 + sum of
         Qb         Ia/Ib
          9.901 *    0.833 =      8.247
Qp =     18.539

Total of 2 streams to confluence:
Flow rates before confluence point:
       9.901      10.292
Area of streams before confluence:
        4.460        5.310
Results of confluence:
Total flow rate =     18.539(CFS)
Time of concentration =    26.850 min.
Effective stream area after confluence =      9.770(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      142.000 to Point/Station      134.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.100(Ft.)
Downstream point/station elevation =  1496.000(Ft.)
Pipe length  =   116.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    18.539(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    18.539(CFS)
Normal flow depth in pipe =   15.14(In.)
Flow top width inside pipe =   18.84(In.)
Critical Depth =   18.72(In.)
Pipe flow velocity =      9.98(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    27.04 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      142.000 to Point/Station      134.400
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      9.770(Ac.)
Runoff from this stream =     18.539(CFS)
Time of concentration =   27.04 min.
Rainfall intensity =     1.983(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1      127.643     12.98           2.926
2        9.407     14.26           2.784
3       51.272     15.53           2.661
4       18.539     27.04           1.983
Largest stream flow has longer or shorter time of concentration
Qp =    127.643 + sum of
         Qa          Tb/Ta
          9.407 *    0.911 =      8.566
         Qa          Tb/Ta
         51.272 *    0.836 =     42.873
         Qa          Tb/Ta
         18.539 *    0.480 =      8.902
Qp =    187.984

Total of 4 main streams to confluence:
```

```
Flow rates before confluence point:
     127.643       9.407      51.272      18.539
Area of streams before confluence:
       59.770        4.150       20.400        9.770


Results of confluence:
Total flow rate =    187.984(CFS)
Time of concentration =    12.985 min.
Effective stream area after confluence  =     94.090(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      142.000 to Point/Station      134.400
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.830
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  84.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    12.98 min.
Rainfall intensity =      2.926(In/Hr) for a   100.0 year storm
Subarea runoff =      4.347(CFS) for      1.790(Ac.)
Total runoff =    192.331(CFS)   Total area =      95.880(Ac.)
End of computations, total study area =           95.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.724
Area averaged RI index number =  70.6
```

- Area 'A' – 2 Year - Pre-Development Condition – Unit Hydrograph

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271 Sq. Mi.
Length along longest watercourse =    4753.00(Ft.)
Length along longest watercourse measured to centroid =    1892.00(Ft.)
Length along longest watercourse =      0.900 Mi.
Length along longest watercourse measured to centroid =      0.358 Mi.
Difference in elevation =     254.00(Ft.)
Slope along watercourse =    282.1628 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.160 Hr.
Lag time =     9.62 Min.
25% of lag time =     2.40 Min.
40% of lag time =     3.85 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           0.55                 95.26

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           1.30                225.16

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    0.550(In)
Area Averaged 100-Year Rainfall =    1.300(In)

Point rain (area averaged) =    0.550(In)
Areal adjustment factor =   99.84 %
Adjusted average point rain =    0.549(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200          83.70         0.000
 Total Area Entered =    173.20(Ac.)
```

```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      83.7  68.2      0.382     0.000        0.382       1.000      0.382
                                                       Sum (F) =   0.382
      Area averaged mean soil loss (F) (In/Hr) =  0.382
      Minimum soil loss rate ((In/Hr)) =  0.191
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.900
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5300
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083         51.976          6.505             11.355
          2   0.167        103.953         27.811             48.545
          3   0.250        155.929         28.601             49.924
          4   0.333        207.905         12.284             21.442
          5   0.417        259.881          6.621             11.557
          6   0.500        311.858          4.609              8.046
          7   0.583        363.834          3.310              5.778
          8   0.667        415.810          2.482              4.332
          9   0.750        467.787          1.808              3.156
         10   0.833        519.763          1.552              2.709
         11   0.917        571.739          1.205              2.104
         12   1.000        623.715          0.949              1.657
         13   1.083        675.692          0.733              1.279
         14   1.167        727.668          0.546              0.954
         15   1.250        779.644          0.520              0.907
         16   1.333        831.621          0.463              0.809
                                    Sum = 100.000   Sum=     174.553
------------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max    |   Low        (In/Hr)
    1   0.08     3.40      0.224       (  0.382)       0.202        0.022
    2   0.17     4.70      0.310       (  0.382)       0.279        0.031
    3   0.25     4.70      0.310       (  0.382)       0.279        0.031
    4   0.33     5.10      0.336       (  0.382)       0.302        0.034
    5   0.42     5.80      0.382       (  0.382)       0.344        0.038
    6   0.50     5.90      0.389       (  0.382)       0.350        0.039
    7   0.58     7.10      0.468          0.382    (  0.421)        0.086
    8   0.67     8.70      0.573          0.382    (  0.516)        0.192
    9   0.75    13.20      0.870          0.382    (  0.783)        0.488
   10   0.83    29.70      1.957          0.382    (  1.761)        1.575
   11   0.92     7.70      0.507          0.382    (  0.457)        0.126
   12   1.00     4.00      0.264       (  0.382)       0.237        0.026
              (Loss Rate Not Used)
      Sum =     100.0                                  Sum =     2.7
        Flood volume = Effective rainfall      0.22(In)
         times area     173.2(Ac.)/[(In)/(Ft.)] =       3.2(Ac.Ft)
        Total soil loss =      0.33(In)
        Total soil loss =     4.692(Ac.Ft)
        Total rainfall =      0.55(In)
        Flood volume =      140866.6 Cubic Feet
        Total soil loss =      204384.4 Cubic Feet
        ------------------------------------------------------------------------
         Peak flow rate of this hydrograph =    108.350(CFS)
        ------------------------------------------------------------------------
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
        ------------------------------------------------------------------------
```

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0018	0.25	Q				
0+10	0.0117	1.44	Q				
0+15	0.0322	2.98	Q				
0+20	0.0591	3.91	Q				
0+25	0.0904	4.54	QV				
0+30	0.1260	5.18	Q				
0+35	0.1690	6.23	QV				
0+40	0.2381	10.04	Q				
0+45	0.3834	21.09	Q				
0+50	0.7572	54.28	VQ				
0+55	1.5034	108.35	V	Q			
1+ 0	2.1863	99.17	V	Q			
1+ 5	2.5277	49.57	Q	V			
1+10	2.7209	28.05	Q	V			
1+15	2.8515	18.96	Q	V			
1+20	2.9455	13.64	Q	V			
1+25	3.0158	10.21	Q	V			
1+30	3.0687	7.68	Q	V			
1+35	3.1123	6.34	Q	V			
1+40	3.1464	4.94	Q	V			
1+45	3.1730	3.87	Q	V			
1+50	3.1936	2.99	Q	V			
1+55	3.2095	2.31	Q	V			
2+ 0	3.2231	1.98	Q	V			
2+ 5	3.2328	1.41	Q	V			
2+10	3.2337	0.13	Q	V			
2+15	3.2339	0.02	Q	V			

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: EXA00232.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271 Sq. Mi.
Length along longest watercourse =    4753.00(Ft.)
Length along longest watercourse measured to centroid =    1892.00(Ft.)
Length along longest watercourse =      0.900 Mi.
Length along longest watercourse measured to centroid =      0.358 Mi.
Difference in elevation =     254.00(Ft.)
Slope along watercourse =    282.1628 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.160 Hr.
Lag time =     9.62 Min.
25% of lag time =     2.40 Min.
40% of lag time =     3.85 Min.
Unit time =     5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           0.85                147.22

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           2.00                346.40

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    2.000(In)

Point rain (area averaged) =    0.850(In)
Areal adjustment factor =   99.92 %
Adjusted average point rain =    0.849(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200           83.70         0.000
 Total Area Entered =    173.20(Ac.)
```

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
83.7	68.2	0.382	0.000	0.382	1.000	0.382
					Sum (F) =	0.382

Area averaged mean soil loss (F) (In/Hr) = 0.382
Minimum soil loss rate ((In/Hr)) = 0.191
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	51.976	6.505	11.355
2	0.167	103.953	27.811	48.545
3	0.250	155.929	28.601	49.924
4	0.333	207.905	12.284	21.442
5	0.417	259.881	6.621	11.557
6	0.500	311.858	4.609	8.046
7	0.583	363.834	3.310	5.778
8	0.667	415.810	2.482	4.332
9	0.750	467.787	1.808	3.156
10	0.833	519.763	1.552	2.709
11	0.917	571.739	1.205	2.104
12	1.000	623.715	0.949	1.657
13	1.083	675.692	0.733	1.279
14	1.167	727.668	0.546	0.954
15	1.250	779.644	0.520	0.907
16	1.333	831.621	0.463	0.809
		Sum = 100.000	Sum=	174.553

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.132	(0.382)		0.119	0.013
2	0.17	1.30	0.132	(0.382)		0.119	0.013
3	0.25	1.10	0.112	(0.382)		0.101	0.011
4	0.33	1.50	0.153	(0.382)		0.138	0.015
5	0.42	1.50	0.153	(0.382)		0.138	0.015
6	0.50	1.80	0.183	(0.382)		0.165	0.018
7	0.58	1.50	0.153	(0.382)		0.138	0.015
8	0.67	1.80	0.183	(0.382)		0.165	0.018
9	0.75	1.80	0.183	(0.382)		0.165	0.018
10	0.83	1.50	0.153	(0.382)		0.138	0.015
11	0.92	1.60	0.163	(0.382)		0.147	0.016
12	1.00	1.80	0.183	(0.382)		0.165	0.018
13	1.08	2.20	0.224	(0.382)		0.202	0.022
14	1.17	2.20	0.224	(0.382)		0.202	0.022
15	1.25	2.20	0.224	(0.382)		0.202	0.022
16	1.33	2.00	0.204	(0.382)		0.183	0.020
17	1.42	2.60	0.265	(0.382)		0.238	0.026
18	1.50	2.70	0.275	(0.382)		0.248	0.028
19	1.58	2.40	0.245	(0.382)		0.220	0.024
20	1.67	2.70	0.275	(0.382)		0.248	0.028
21	1.75	3.30	0.336	(0.382)		0.303	0.034
22	1.83	3.10	0.316	(0.382)		0.284	0.032
23	1.92	2.90	0.296	(0.382)		0.266	0.030
24	2.00	3.00	0.306	(0.382)		0.275	0.031
25	2.08	3.10	0.316	(0.382)		0.284	0.032
26	2.17	4.20	0.428	0.382	(	0.385)	0.046
27	2.25	5.00	0.510	0.382	(	0.459)	0.128
28	2.33	3.50	0.357	(0.382)		0.321	0.036
29	2.42	6.80	0.693	0.382	(	0.624)	0.311
30	2.50	7.30	0.744	0.382	(	0.670)	0.362

```
31   2.58     8.20      0.836          0.382    (  0.752)        0.454
32   2.67     5.90      0.601          0.382    (  0.541)        0.220
33   2.75     2.00      0.204       (  0.382)       0.183        0.020
34   2.83     1.80      0.183       (  0.382)       0.165        0.018
35   2.92     1.80      0.183       (  0.382)       0.165        0.018
36   3.00     0.60      0.061       (  0.382)       0.055        0.006
            (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     2.2
      Flood volume = Effective rainfall      0.18(In)
       times area     173.2(Ac.)/[(In)/(Ft.)] =       2.6(Ac.Ft)
      Total soil loss =      0.67(In)
      Total soil loss =     9.661(Ac.Ft)
      Total rainfall =      0.85(In)
      Flood volume =      113169.4 Cubic Feet
      Total soil loss =      420834.3 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     51.585(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
-------------------------------------------------------------------------
  0+ 5       0.0010      0.15  Q         |         |         |         |
  0+10       0.0065      0.79  Q         |         |         |         |
  0+15       0.0164      1.43  Q         |         |         |         |
  0+20       0.0278      1.66  VQ        |         |         |         |
  0+25       0.0410      1.91  VQ        |         |         |         |
  0+30       0.0563      2.22  VQ        |         |         |         |
  0+35       0.0733      2.47  |Q        |         |         |         |
  0+40       0.0912      2.60  |Q        |         |         |         |
  0+45       0.1099      2.72  |Q        |         |         |         |
  0+50       0.1296      2.86  |Q        |         |         |         |
  0+55       0.1490      2.82  |QV       |         |         |         |
  1+ 0       0.1682      2.79  |QV       |         |         |         |
  1+ 5       0.1887      2.97  |QV       |         |         |         |
  1+10       0.2113      3.29  | QV      |         |         |         |
  1+15       0.2357      3.55  | QV      |         |         |         |
  1+20       0.2609      3.65  | Q V     |         |         |         |
  1+25       0.2863      3.69  | Q V     |         |         |         |
  1+30       0.3134      3.94  | Q V     |         |         |         |
  1+35       0.3426      4.25  | Q  V    |         |         |         |
  1+40       0.3724      4.32  | Q  V    |         |         |         |
  1+45       0.4032      4.48  | Q   V   |         |         |         |
  1+50       0.4370      4.90  |  Q  V   |         |         |         |
  1+55       0.4725      5.16  |  Q   V  |         |         |         |
  2+ 0       0.5080      5.15  |  Q   V  |         |         |         |
  2+ 5       0.5436      5.17  |  Q    V |         |         |         |
  2+10       0.5811      5.44  |  Q    V |         |         |         |
  2+15       0.6305      7.18  |   Q    V|         |         |         |
  2+20       0.7054     10.88  |      Q  V         |         |         |
  2+25       0.8015     13.95  |        Q| V       |         |         |
  2+30       0.9754     25.25  |         |   VQ    |         |         |
  2+35       1.2622     41.64  |         |      V|      Q  |         |
  2+40       1.6175     51.59  |         |         |   V     |   Q     |
  2+45       1.9384     46.60  |         |         |        V|Q        |
  2+50       2.1439     29.83  |         |        Q|         |  V      |
  2+55       2.2659     17.72  |         |Q        |         |   V     |
  3+ 0       2.3533     12.69  |       Q |         |         |     V   |
  3+ 5       2.4177      9.36  |     Q   |         |         |      V  |
  3+10       2.4641      6.73  |   Q     |         |         |      V  |
  3+15       2.4982      4.95  |  Q      |         |         |       V |
  3+20       2.5247      3.85  | Q       |         |         |       V |
  3+25       2.5456      3.04  | Q       |         |         |        V|
  3+30       2.5617      2.34  |Q        |         |         |        V|
  3+35       2.5740      1.78  |Q        |         |         |        V|
  3+40       2.5839      1.44  Q         |         |         |        V|
  3+45       2.5910      1.03  Q         |         |         |        V|
  3+50       2.5955      0.65  Q         |         |         |        V|
```

```
   3+55       2.5972      0.25  Q          |          |          |        V|
   4+ 0       2.5976      0.06  Q          |          |          |        V|
   4+ 5       2.5978      0.04  Q          |          |          |        V|
   4+10       2.5980      0.02  Q          |          |          |        V|
   4+15       2.5980      0.00  Q          |          |          |         V
-------------------------------------------------------------------------
```

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: EXA00262.out


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------------------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271 Sq. Mi.
Length along longest watercourse =    4753.00(Ft.)
Length along longest watercourse measured to centroid =    1892.00(Ft.)
Length along longest watercourse =      0.900 Mi.
Length along longest watercourse measured to centroid =      0.358 Mi.
Difference in elevation =     254.00(Ft.)
Slope along watercourse =    282.1628 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.160 Hr.
Lag time =     9.62 Min.
25% of lag time =     2.40 Min.
40% of lag time =     3.85 Min.
Unit time =     5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           1.20                 207.84

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           3.00                 519.60

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.200(In)
Area Averaged 100-Year Rainfall =    3.000(In)

Point rain (area averaged) =    1.200(In)
Areal adjustment factor =   99.94 %
Adjusted average point rain =    1.199(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200           83.70          0.000
 Total Area Entered =    173.20(Ac.)
```

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
83.7	68.2	0.382	0.000	0.382	1.000	0.382
					Sum (F) =	0.382

Area averaged mean soil loss (F) (In/Hr) = 0.382
Minimum soil loss rate ((In/Hr)) = 0.191
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	51.976	6.505	11.355
2	0.167	103.953	27.811	48.545
3	0.250	155.929	28.601	49.924
4	0.333	207.905	12.284	21.442
5	0.417	259.881	6.621	11.557
6	0.500	311.858	4.609	8.046
7	0.583	363.834	3.310	5.778
8	0.667	415.810	2.482	4.332
9	0.750	467.787	1.808	3.156
10	0.833	519.763	1.552	2.709
11	0.917	571.739	1.205	2.104
12	1.000	623.715	0.949	1.657
13	1.083	675.692	0.733	1.279
14	1.167	727.668	0.546	0.954
15	1.250	779.644	0.520	0.907
16	1.333	831.621	0.463	0.809
			Sum = 100.000	Sum= 174.553

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.072	(0.382)		0.065	0.007
2	0.17	0.60	0.086	(0.382)		0.078	0.009
3	0.25	0.60	0.086	(0.382)		0.078	0.009
4	0.33	0.60	0.086	(0.382)		0.078	0.009
5	0.42	0.60	0.086	(0.382)		0.078	0.009
6	0.50	0.70	0.101	(0.382)		0.091	0.010
7	0.58	0.70	0.101	(0.382)		0.091	0.010
8	0.67	0.70	0.101	(0.382)		0.091	0.010
9	0.75	0.70	0.101	(0.382)		0.091	0.010
10	0.83	0.70	0.101	(0.382)		0.091	0.010
11	0.92	0.70	0.101	(0.382)		0.091	0.010
12	1.00	0.80	0.115	(0.382)		0.104	0.012
13	1.08	0.80	0.115	(0.382)		0.104	0.012
14	1.17	0.80	0.115	(0.382)		0.104	0.012
15	1.25	0.80	0.115	(0.382)		0.104	0.012
16	1.33	0.80	0.115	(0.382)		0.104	0.012
17	1.42	0.80	0.115	(0.382)		0.104	0.012
18	1.50	0.80	0.115	(0.382)		0.104	0.012
19	1.58	0.80	0.115	(0.382)		0.104	0.012
20	1.67	0.80	0.115	(0.382)		0.104	0.012
21	1.75	0.80	0.115	(0.382)		0.104	0.012
22	1.83	0.80	0.115	(0.382)		0.104	0.012
23	1.92	0.80	0.115	(0.382)		0.104	0.012
24	2.00	0.90	0.130	(0.382)		0.117	0.013
25	2.08	0.80	0.115	(0.382)		0.104	0.012
26	2.17	0.90	0.130	(0.382)		0.117	0.013
27	2.25	0.90	0.130	(0.382)		0.117	0.013
28	2.33	0.90	0.130	(0.382)		0.117	0.013
29	2.42	0.90	0.130	(0.382)		0.117	0.013
30	2.50	0.90	0.130	(0.382)		0.117	0.013

```
 31   2.58     0.90      0.130       (  0.382)       0.117        0.013
 32   2.67     0.90      0.130       (  0.382)       0.117        0.013
 33   2.75     1.00      0.144       (  0.382)       0.130        0.014
 34   2.83     1.00      0.144       (  0.382)       0.130        0.014
 35   2.92     1.00      0.144       (  0.382)       0.130        0.014
 36   3.00     1.00      0.144       (  0.382)       0.130        0.014
 37   3.08     1.00      0.144       (  0.382)       0.130        0.014
 38   3.17     1.10      0.158       (  0.382)       0.142        0.016
 39   3.25     1.10      0.158       (  0.382)       0.142        0.016
 40   3.33     1.10      0.158       (  0.382)       0.142        0.016
 41   3.42     1.20      0.173       (  0.382)       0.155        0.017
 42   3.50     1.30      0.187       (  0.382)       0.168        0.019
 43   3.58     1.40      0.201       (  0.382)       0.181        0.020
 44   3.67     1.40      0.201       (  0.382)       0.181        0.020
 45   3.75     1.50      0.216       (  0.382)       0.194        0.022
 46   3.83     1.50      0.216       (  0.382)       0.194        0.022
 47   3.92     1.60      0.230       (  0.382)       0.207        0.023
 48   4.00     1.60      0.230       (  0.382)       0.207        0.023
 49   4.08     1.70      0.245       (  0.382)       0.220        0.024
 50   4.17     1.80      0.259       (  0.382)       0.233        0.026
 51   4.25     1.90      0.273       (  0.382)       0.246        0.027
 52   4.33     2.00      0.288       (  0.382)       0.259        0.029
 53   4.42     2.10      0.302       (  0.382)       0.272        0.030
 54   4.50     2.10      0.302       (  0.382)       0.272        0.030
 55   4.58     2.20      0.317       (  0.382)       0.285        0.032
 56   4.67     2.30      0.331       (  0.382)       0.298        0.033
 57   4.75     2.40      0.345       (  0.382)       0.311        0.035
 58   4.83     2.40      0.345       (  0.382)       0.311        0.035
 59   4.92     2.50      0.360       (  0.382)       0.324        0.036
 60   5.00     2.60      0.374       (  0.382)       0.337        0.037
 61   5.08     3.10      0.446          0.382    (  0.402)       0.064
 62   5.17     3.60      0.518          0.382    (  0.466)       0.136
 63   5.25     3.90      0.561          0.382    (  0.505)       0.180
 64   5.33     4.20      0.604          0.382    (  0.544)       0.223
 65   5.42     4.70      0.676          0.382    (  0.609)       0.295
 66   5.50     5.60      0.806          0.382    (  0.725)       0.424
 67   5.58     1.90      0.273       (  0.382)       0.246        0.027
 68   5.67     0.90      0.130       (  0.382)       0.117        0.013
 69   5.75     0.60      0.086       (  0.382)       0.078        0.009
 70   5.83     0.50      0.072       (  0.382)       0.065        0.007
 71   5.92     0.30      0.043       (  0.382)       0.039        0.004
 72   6.00     0.20      0.029       (  0.382)       0.026        0.003
            (Loss Rate Not Used)
   Sum =     100.0                                    Sum =     2.4
      Flood volume = Effective rainfall      0.20(In)
       times area     173.2(Ac.)/[(In)/(Ft.)] =       2.9(Ac.Ft)
      Total soil loss =      1.00(In)
      Total soil loss =    14.423(Ac.Ft)
      Total rainfall =      1.20(In)
      Flood volume =      125755.2 Cubic Feet
      Total soil loss =      628254.8 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     44.584(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
-------------------------------------------------------------------------
  0+ 5       0.0006      0.08  Q         |         |         |         |
  0+10       0.0036      0.45  Q         |         |         |         |
  0+15       0.0097      0.88  Q         |         |         |         |
  0+20       0.0173      1.10  Q         |         |         |         |
  0+25       0.0257      1.22  Q         |         |         |         |
  0+30       0.0347      1.31  VQ        |         |         |         |
  0+35       0.0445      1.43  VQ        |         |         |         |
  0+40       0.0552      1.54  VQ        |         |         |         |
  0+45       0.0662      1.60  VQ        |         |         |         |
  0+50       0.0775      1.64  |Q        |         |         |         |
```

```
0+55      0.0890      1.67  |Q        |         |         |         |
1+ 0      0.1008      1.71  |Q        |         |         |         |
1+ 5      0.1132      1.80  |Q        |         |         |         |
1+10      0.1262      1.89  |Q        |         |         |         |
1+15      0.1395      1.93  |Q        |         |         |         |
1+20      0.1530      1.96  |QV       |         |         |         |
1+25      0.1666      1.97  |QV       |         |         |         |
1+30      0.1802      1.98  |QV       |         |         |         |
1+35      0.1939      1.99  |QV       |         |         |         |
1+40      0.2076      1.99  |QV       |         |         |         |
1+45      0.2214      2.00  |Q V      |         |         |         |
1+50      0.2352      2.00  |Q V      |         |         |         |
1+55      0.2490      2.01  |Q V      |         |         |         |
2+ 0      0.2629      2.02  |Q V      |         |         |         |
2+ 5      0.2773      2.08  |Q V      |         |         |         |
2+10      0.2917      2.10  |Q  V     |         |         |         |
2+15      0.3064      2.13  |Q  V     |         |         |         |
2+20      0.3214      2.19  |Q  V     |         |         |         |
2+25      0.3366      2.21  |Q  V     |         |         |         |
2+30      0.3520      2.22  |Q  V     |         |         |         |
2+35      0.3673      2.23  |Q   V    |         |         |         |
2+40      0.3828      2.24  |Q   V    |         |         |         |
2+45      0.3984      2.26  |Q   V    |         |         |         |
2+50      0.4145      2.34  |Q   V    |         |         |         |
2+55      0.4311      2.41  |Q   V    |         |         |         |
3+ 0      0.4479      2.44  |Q    V   |         |         |         |
3+ 5      0.4649      2.46  |Q    V   |         |         |         |
3+10      0.4820      2.49  |Q    V   |         |         |         |
3+15      0.4997      2.57  | Q   V   |         |         |         |
3+20      0.5180      2.65  | Q    V  |         |         |         |
3+25      0.5366      2.70  | Q    V  |         |         |         |
3+30      0.5560      2.81  | Q    V  |         |         |         |
3+35      0.5765      2.98  | Q    V  |         |         |         |
3+40      0.5983      3.17  | Q     V |         |         |         |
3+45      0.6211      3.31  | Q     V |         |         |         |
3+50      0.6449      3.45  | Q     V |         |         |         |
3+55      0.6695      3.58  | Q      V|         |         |         |
4+ 0      0.6950      3.71  | Q      V|         |         |         |
4+ 5      0.7214      3.83  |  Q     V|         |         |         |
4+10      0.7488      3.98  |  Q      V         |         |         |
4+15      0.7776      4.17  |  Q      V         |         |         |
4+20      0.8078      4.39  |  Q      |V        |         |         |
4+25      0.8396      4.62  |  Q      |V        |         |         |
4+30      0.8729      4.84  |  Q      | V       |         |         |
4+35      0.9074      5.00  |   Q     | V       |         |         |
4+40      0.9430      5.17  |   Q     |  V      |         |         |
4+45      0.9801      5.39  |   Q     |  V      |         |         |
4+50      1.0186      5.60  |   Q     |   V     |         |         |
4+55      1.0583      5.76  |   Q     |   V     |         |         |
5+ 0      1.0992      5.93  |   Q     |    V    |         |         |
5+ 5      1.1435      6.43  |    Q    |    V    |         |         |
5+10      1.2034      8.71  |     Q   |     V   |         |         |
5+15      1.3007     14.12  |         |Q      V |         |         |
5+20      1.4449     20.93  |         |     Q   V         |         |
5+25      1.6370     27.90  |         |         | Q       |         |
5+30      1.8920     37.03  |         |         |     V  Q|         |
5+35      2.1991     44.58  |         |         |        V    Q     |
5+40      2.4370     34.55  |         |         |      Q  |  V      |
5+45      2.5651     18.59  |         |   Q     |         |    V    |
5+50      2.6474     11.96  |        Q|         |         |     V   |
5+55      2.7079      8.78  |      Q  |         |         |      V  |
6+ 0      2.7534      6.61  |    Q    |         |         |       V |
6+ 5      2.7881      5.03  |   Q     |         |         |       V |
6+10      2.8141      3.79  |  Q      |         |         |       V |
6+15      2.8345      2.95  | Q       |         |         |        V|
6+20      2.8501      2.28  |Q        |         |         |        V|
6+25      2.8623      1.77  |Q        |         |         |        V|
6+30      2.8714      1.33  |Q        |         |         |        V|
6+35      2.8781      0.97  Q         |         |         |        V|
6+40      2.8831      0.72  Q         |         |         |        V|
6+45      2.8860      0.42  Q         |         |         |        V|
6+50      2.8864      0.06  Q         |         |         |        V|
6+55      2.8867      0.04  Q         |         |         |        V|
```

```
    7+ 0       2.8868      0.02  Q         |         |         |        V|
    7+ 5       2.8869      0.01  Q         |         |         |        V|
    7+10       2.8869      0.01  Q         |         |         |        V|
    7+15       2.8869      0.00  Q         |         |         |         V
------------------------------------------------------------------------
```

```
              U n i t   H y d r o g r a p h   A n a l y s i s

              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                    Study date  11/08/21 File: EXA002242.out


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      ----------------------------------------------------------------------

      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6406

      ----------------------------------------------------------------------
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ----------------------------------------------------------------------
      TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
      EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR  HOUR STORM
      HUNSAKER & ASSOCIATES,
      BY: BRIAN LOWELL, PE
      ----------------------------------------------------------------------
      Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271
Sq. Mi.
      Length along longest watercourse =    4753.00(Ft.)
      Length along longest watercourse measured to centroid =    1892.00(Ft.)
      Length along longest watercourse =      0.900 Mi.
      Length along longest watercourse measured to centroid =      0.358 Mi.
      Difference in elevation =     254.00(Ft.)
      Slope along watercourse =    282.1628 Ft./Mi.
      Average Manning's 'N' = 0.030
      Lag time =    0.160 Hr.
      Lag time =     9.62 Min.
      25% of lag time =     2.40 Min.
      40% of lag time =     3.85 Min.
      Unit time =    15.00 Min.
      Duration of storm = 24 Hour(s)
      User Entered Base Flow =     0.00(CFS)

      2 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
            173.20            2.00               346.40

      100 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
            173.20            5.00               866.00

      STORM EVENT (YEAR) =    2.00
      Area Averaged 2-Year Rainfall =    2.000(In)
      Area Averaged 100-Year Rainfall =    5.000(In)
```

```
Point rain (area averaged) =    2.000(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    1.999(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200           83.70         0.000
 Total Area Entered =    173.20(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
83.7  68.2      0.382     0.000        0.382       1.000      0.382
                                                   Sum (F) =   0.382
Area averaged mean soil loss (F) (In/Hr) =  0.382
Minimum soil loss rate ((In/Hr)) =  0.191
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------

             U n i t  H y d r o g r a p h
                    VALLEY S-Curve
------------------------------------------------------------------------
             Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.250        155.929         34.579            60.360
    2   0.500        311.858         46.572            81.293
    3   0.750        467.787         10.847            18.934
    4   1.000        623.715          4.704             8.211
    5   1.250        779.644          2.305             4.023
    6   1.500        935.573          0.992             1.732
                              Sum = 100.000   Sum=     174.553
------------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.25	0.20	0.016	(0.674)		0.014	0.002
2	0.50	0.30	0.024	(0.666)		0.022	0.002
3	0.75	0.30	0.024	(0.658)		0.022	0.002
4	1.00	0.40	0.032	(0.651)		0.029	0.003
5	1.25	0.30	0.024	(0.643)		0.022	0.002
6	1.50	0.30	0.024	(0.635)		0.022	0.002
7	1.75	0.30	0.024	(0.628)		0.022	0.002
8	2.00	0.40	0.032	(0.620)		0.029	0.003
9	2.25	0.40	0.032	(0.613)		0.029	0.003
10	2.50	0.40	0.032	(0.605)		0.029	0.003
11	2.75	0.50	0.040	(0.598)		0.036	0.004
12	3.00	0.50	0.040	(0.590)		0.036	0.004
13	3.25	0.50	0.040	(0.583)		0.036	0.004
14	3.50	0.50	0.040	(0.576)		0.036	0.004
15	3.75	0.50	0.040	(0.569)		0.036	0.004
16	4.00	0.60	0.048	(0.562)		0.043	0.005
17	4.25	0.60	0.048	(0.554)		0.043	0.005
18	4.50	0.70	0.056	(0.547)		0.050	0.006
19	4.75	0.70	0.056	(0.540)		0.050	0.006
20	5.00	0.80	0.064	(0.533)		0.058	0.006
21	5.25	0.60	0.048	(0.526)		0.043	0.005

22	5.50	0.70	0.056	(0.520)	0.050	0.006
23	5.75	0.80	0.064	(0.513)	0.058	0.006
24	6.00	0.80	0.064	(0.506)	0.058	0.006
25	6.25	0.90	0.072	(0.499)	0.065	0.007
26	6.50	0.90	0.072	(0.493)	0.065	0.007
27	6.75	1.00	0.080	(0.486)	0.072	0.008
28	7.00	1.00	0.080	(0.479)	0.072	0.008
29	7.25	1.00	0.080	(0.473)	0.072	0.008
30	7.50	1.10	0.088	(0.467)	0.079	0.009
31	7.75	1.20	0.096	(0.460)	0.086	0.010
32	8.00	1.30	0.104	(0.454)	0.094	0.010
33	8.25	1.50	0.120	(0.447)	0.108	0.012
34	8.50	1.50	0.120	(0.441)	0.108	0.012
35	8.75	1.60	0.128	(0.435)	0.115	0.013
36	9.00	1.70	0.136	(0.429)	0.122	0.014
37	9.25	1.90	0.152	(0.423)	0.137	0.015
38	9.50	2.00	0.160	(0.417)	0.144	0.016
39	9.75	2.10	0.168	(0.411)	0.151	0.017
40	10.00	2.20	0.176	(0.405)	0.158	0.018
41	10.25	1.50	0.120	(0.399)	0.108	0.012
42	10.50	1.50	0.120	(0.393)	0.108	0.012
43	10.75	2.00	0.160	(0.388)	0.144	0.016
44	11.00	2.00	0.160	(0.382)	0.144	0.016
45	11.25	1.90	0.152	(0.376)	0.137	0.015
46	11.50	1.90	0.152	(0.371)	0.137	0.015
47	11.75	1.70	0.136	(0.365)	0.122	0.014
48	12.00	1.80	0.144	(0.360)	0.130	0.014
49	12.25	2.50	0.200	(0.354)	0.180	0.020
50	12.50	2.60	0.208	(0.349)	0.187	0.021
51	12.75	2.80	0.224	(0.344)	0.202	0.022
52	13.00	2.90	0.232	(0.339)	0.209	0.023
53	13.25	3.40	0.272	(0.334)	0.245	0.027
54	13.50	3.40	0.272	(0.329)	0.245	0.027
55	13.75	2.30	0.184	(0.324)	0.166	0.018
56	14.00	2.30	0.184	(0.319)	0.166	0.018
57	14.25	2.70	0.216	(0.314)	0.194	0.022
58	14.50	2.60	0.208	(0.309)	0.187	0.021
59	14.75	2.60	0.208	(0.304)	0.187	0.021
60	15.00	2.50	0.200	(0.300)	0.180	0.020
61	15.25	2.40	0.192	(0.295)	0.173	0.019
62	15.50	2.30	0.184	(0.291)	0.166	0.018
63	15.75	1.90	0.152	(0.286)	0.137	0.015
64	16.00	1.90	0.152	(0.282)	0.137	0.015
65	16.25	0.40	0.032	(0.277)	0.029	0.003
66	16.50	0.40	0.032	(0.273)	0.029	0.003
67	16.75	0.30	0.024	(0.269)	0.022	0.002
68	17.00	0.30	0.024	(0.265)	0.022	0.002
69	17.25	0.50	0.040	(0.261)	0.036	0.004
70	17.50	0.50	0.040	(0.257)	0.036	0.004
71	17.75	0.50	0.040	(0.253)	0.036	0.004
72	18.00	0.40	0.032	(0.249)	0.029	0.003
73	18.25	0.40	0.032	(0.246)	0.029	0.003
74	18.50	0.40	0.032	(0.242)	0.029	0.003
75	18.75	0.30	0.024	(0.239)	0.022	0.002
76	19.00	0.20	0.016	(0.235)	0.014	0.002
77	19.25	0.30	0.024	(0.232)	0.022	0.002
78	19.50	0.40	0.032	(0.229)	0.029	0.003
79	19.75	0.30	0.024	(0.226)	0.022	0.002
80	20.00	0.20	0.016	(0.223)	0.014	0.002
81	20.25	0.30	0.024	(0.220)	0.022	0.002
82	20.50	0.30	0.024	(0.217)	0.022	0.002
83	20.75	0.30	0.024	(0.214)	0.022	0.002
84	21.00	0.20	0.016	(0.211)	0.014	0.002
85	21.25	0.30	0.024	(0.209)	0.022	0.002
86	21.50	0.20	0.016	(0.207)	0.014	0.002

```
87  21.75     0.30      0.024       (  0.204)       0.022        0.002
88  22.00     0.20      0.016       (  0.202)       0.014        0.002
89  22.25     0.30      0.024       (  0.200)       0.022        0.002
90  22.50     0.20      0.016       (  0.198)       0.014        0.002
91  22.75     0.20      0.016       (  0.197)       0.014        0.002
92  23.00     0.20      0.016       (  0.195)       0.014        0.002
93  23.25     0.20      0.016       (  0.194)       0.014        0.002
94  23.50     0.20      0.016       (  0.193)       0.014        0.002
95  23.75     0.20      0.016       (  0.192)       0.014        0.002
96  24.00     0.20      0.016       (  0.191)       0.014        0.002
          (Loss Rate Not Used)
   Sum =     100.0                                   Sum =     0.8
     Flood volume = Effective rainfall      0.20(In)
      times area     173.2(Ac.)/[(In)/(Ft.)] =       2.9(Ac.Ft)
     Total soil loss =      1.80(In)
     Total soil loss =    25.971(Ac.Ft)
     Total rainfall =      2.00(In)
     Flood volume =      125700.7 Cubic Feet
     Total soil loss =     1131306.0 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      4.595(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         24 - H O U R    S T O R M
                    R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------------
  0+15       0.0020      0.10  Q          |         |         |         |
  0+30       0.0077      0.27  VQ         |         |         |         |
  0+45       0.0153      0.37  VQ         |         |         |         |
  1+ 0       0.0246      0.45  VQ         |         |         |         |
  1+15       0.0344      0.48  VQ         |         |         |         |
  1+30       0.0434      0.43  VQ         |         |         |         |
  1+45       0.0521      0.43  VQ         |         |         |         |
  2+ 0       0.0619      0.47  VQ         |         |         |         |
  2+15       0.0729      0.53   VQ        |         |         |         |
  2+30       0.0842      0.55  |VQ        |         |         |         |
  2+45       0.0967      0.60  |VQ        |         |         |         |
  3+ 0       0.1105      0.67  |VQ        |         |         |         |
  3+15       0.1247      0.69  |VQ        |         |         |         |
  3+30       0.1390      0.69  |VQ        |         |         |         |
  3+45       0.1534      0.70  | Q        |         |         |         |
  4+ 0       0.1689      0.75  | Q        |         |         |         |
  4+15       0.1856      0.81  | VQ       |         |         |         |
  4+30       0.2037      0.88  | VQ       |         |         |         |
  4+45       0.2233      0.95  |  Q       |         |         |         |
  5+ 0       0.2442      1.01  |  VQ      |         |         |         |
  5+15       0.2647      0.99  |  Q       |         |         |         |
  5+30       0.2838      0.93  |  Q       |         |         |         |
  5+45       0.3048      1.02  |   Q      |         |         |         |
  6+ 0       0.3273      1.09  |   Q      |         |         |         |
  6+15       0.3511      1.15  |   Q      |         |         |         |
  6+30       0.3764      1.22  |   QV     |         |         |         |
  6+45       0.4031      1.29  |    Q     |         |         |         |
  7+ 0       0.4313      1.37  |    Q     |         |         |         |
  7+15       0.4599      1.38  |    QV    |         |         |         |
  7+30       0.4897      1.44  |    QV    |         |         |         |
  7+45       0.5219      1.56  |     QV   |         |         |         |
  8+ 0       0.5567      1.69  |     QV   |         |         |         |
  8+15       0.5954      1.87  |      QV  |         |         |         |
  8+30       0.6372      2.03  |       Q  |         |         |         |
```

```
  8+45       0.6809      2.11  |       QV|         |         |         |
  9+ 0       0.7273      2.25  |       Q V         |         |         |
  9+15       0.7775      2.43  |        QV         |         |         |
  9+30       0.8319      2.63  |         QV        |         |         |
  9+45       0.8895      2.79  |         |QV       |         |         |
 10+ 0       0.9501      2.93  |         |Q V      |         |         |
 10+15       1.0057      2.69  |         Q  V      |         |         |
 10+30       1.0524      2.26  |        Q|   V     |         |         |
 10+45       1.1022      2.41  |        Q|    V    |         |         |
 11+ 0       1.1578      2.69  |         Q     V   |         |         |
 11+15       1.2136      2.70  |         Q     V   |         |         |
 11+30       1.2685      2.66  |         Q      V  |         |         |
 11+45       1.3214      2.56  |         Q       V |         |         |
 12+ 0       1.3727      2.48  |        Q|        V|         |         |
 12+15       1.4315      2.85  |         |Q       V|         |         |
 12+30       1.5008      3.35  |         |  Q      V         |         |
 12+45       1.5756      3.62  |         |   Q     |V        |         |
 13+ 0       1.6554      3.86  |         |    Q    | V       |         |
 13+15       1.7428      4.23  |         |     Q   |   V     |         |
 13+30       1.8377      4.60  |         |       Q |    V    |         |
 13+45       1.9236      4.15  |         |     Q   |     V   |         |
 14+ 0       1.9954      3.48  |         |  Q      |      V  |         |
 14+15       2.0682      3.52  |         |   Q     |       V |         |
 14+30       2.1440      3.67  |         |   Q     |        V|         |
 14+45       2.2189      3.63  |         |   Q     |         V         |
 15+ 0       2.2928      3.58  |         |   Q     |         |V        |
 15+15       2.3645      3.47  |         |  Q      |         | V       |
 15+30       2.4335      3.34  |         |  Q      |         |  V      |
 15+45       2.4968      3.06  |         | Q       |         |   V     |
 16+ 0       2.5542      2.78  |         |Q        |         |    V    |
 16+15       2.5951      1.98  |      Q  |         |         |    V    |
 16+30       2.6152      0.97  |  Q      |         |         |     V   |
 16+45       2.6293      0.68  | Q       |         |         |     V   |
 17+ 0       2.6399      0.51  | Q       |         |         |     V   |
 17+15       2.6512      0.55  | Q       |         |         |     V   |
 17+30       2.6647      0.65  | Q       |         |         |     V   |
 17+45       2.6787      0.68  | Q       |         |         |      V  |
 18+ 0       2.6919      0.64  | Q       |         |         |      V  |
 18+15       2.7039      0.58  | Q       |         |         |      V  |
 18+30       2.7157      0.57  | Q       |         |         |      V  |
 18+45       2.7263      0.51  | Q       |         |         |      V  |
 19+ 0       2.7346      0.40  |Q        |         |         |      V  |
 19+15       2.7421      0.37  |Q        |         |         |       V |
 19+30       2.7516      0.46  |Q        |         |         |       V |
 19+45       2.7615      0.48  |Q        |         |         |       V |
 20+ 0       2.7694      0.38  |Q        |         |         |       V |
 20+15       2.7768      0.36  |Q        |         |         |       V |
 20+30       2.7852      0.41  |Q        |         |         |       V |
 20+45       2.7937      0.41  |Q        |         |         |       V |
 21+ 0       2.8013      0.37  |Q        |         |         |       V |
 21+15       2.8086      0.35  |Q        |         |         |       V |
 21+30       2.8160      0.36  |Q        |         |         |        V|
 21+45       2.8231      0.35  |Q        |         |         |        V|
 22+ 0       2.8304      0.35  |Q        |         |         |        V|
 22+15       2.8376      0.35  |Q        |         |         |        V|
 22+30       2.8449      0.35  |Q        |         |         |        V|
 22+45       2.8510      0.30  |Q        |         |         |        V|
 23+ 0       2.8569      0.29  |Q        |         |         |        V|
 23+15       2.8628      0.28  |Q        |         |         |        V|
 23+30       2.8686      0.28  |Q        |         |         |        V|
 23+45       2.8743      0.28  |Q        |         |         |        V|
 24+ 0       2.8801      0.28  |Q        |         |         |        V|
 24+15       2.8839      0.18  Q         |         |         |        V|
 24+30       2.8850      0.05  Q         |         |         |        V|
 24+45       2.8854      0.02  Q         |         |         |        V|
```

```
   25+ 0       2.8856      0.01  Q          |          |          |         V|
   25+15       2.8857      0.00  Q          |          |          |         V|
-------------------------------------------------------------------------------
```

- Area 'A' – 10 Year - Pre-Development Condition – Unit Hydrograph

```
        U n i t   H y d r o g r a p h   A n a l y s i s

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
               Study date  05/18/21 File: EXA010110.out


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
------------------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271 Sq. Mi.
Length along longest watercourse =    4753.00(Ft.)
Length along longest watercourse measured to centroid =    1892.00(Ft.)
Length along longest watercourse =      0.900 Mi.
Length along longest watercourse measured to centroid =      0.358 Mi.
Difference in elevation =     254.00(Ft.)
Slope along watercourse =    282.1628 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.160 Hr.
Lag time =     9.62 Min.
25% of lag time =     2.40 Min.
40% of lag time =     3.85 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           0.55                 95.26

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           1.30                225.16

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    0.550(In)
Area Averaged 100-Year Rainfall =    1.300(In)

Point rain (area averaged) =    0.859(In)
Areal adjustment factor =   99.84 %
Adjusted average point rain =    0.857(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200          83.70         0.000
 Total Area Entered =    173.20(Ac.)
```

```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      83.7  83.7      0.202     0.000        0.202       1.000      0.202
                                                       Sum (F) =   0.202
      Area averaged mean soil loss (F) (In/Hr) =  0.202
      Minimum soil loss rate ((In/Hr)) =  0.101
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.900
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5300
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083         51.976          6.505             11.355
          2   0.167        103.953         27.811             48.545
          3   0.250        155.929         28.601             49.924
          4   0.333        207.905         12.284             21.442
          5   0.417        259.881          6.621             11.557
          6   0.500        311.858          4.609              8.046
          7   0.583        363.834          3.310              5.778
          8   0.667        415.810          2.482              4.332
          9   0.750        467.787          1.808              3.156
         10   0.833        519.763          1.552              2.709
         11   0.917        571.739          1.205              2.104
         12   1.000        623.715          0.949              1.657
         13   1.083        675.692          0.733              1.279
         14   1.167        727.668          0.546              0.954
         15   1.250        779.644          0.520              0.907
         16   1.333        831.621          0.463              0.809
                                    Sum = 100.000   Sum=     174.553
------------------------------------------------------------------------


 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
    1   0.08     3.40      0.350          0.202    (  0.315)        0.148
    2   0.17     4.70      0.483          0.202    (  0.435)        0.282
    3   0.25     4.70      0.483          0.202    (  0.435)        0.282
    4   0.33     5.10      0.525          0.202    (  0.472)        0.323
    5   0.42     5.80      0.597          0.202    (  0.537)        0.395
    6   0.50     5.90      0.607          0.202    (  0.546)        0.405
    7   0.58     7.10      0.730          0.202    (  0.657)        0.529
    8   0.67     8.70      0.895          0.202    (  0.805)        0.693
    9   0.75    13.20      1.358          0.202    (  1.222)        1.156
   10   0.83    29.70      3.055          0.202    (  2.750)        2.853
   11   0.92     7.70      0.792          0.202    (  0.713)        0.590
   12   1.00     4.00      0.411          0.202    (  0.370)        0.210
              (Loss Rate Not Used)
      Sum =     100.0                                 Sum =     7.9
      Flood volume = Effective rainfall      0.66(In)
       times area     173.2(Ac.)/[(In)/(Ft.)] =       9.5(Ac.Ft)
      Total soil loss =      0.20(In)
      Total soil loss =     2.913(Ac.Ft)
      Total rainfall =      0.86(In)
      Flood volume =      412053.2 Cubic Feet
      Total soil loss =      126887.5 Cubic Feet
      ------------------------------------------------------------------------
       Peak flow rate of this hydrograph =    232.917(CFS)
      ------------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         1 - H O U R    S T O R M
                  R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------------
```

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	75.0	150.0	225.0	300.0
0+ 5	0.0116	1.68	Q				
0+10	0.0831	10.38	VQ				
0+15	0.2502	24.27	V Q				
0+20	0.4884	34.59	V Q				
0+25	0.7776	41.98	V Q				
0+30	1.1246	50.39	V Q				
0+35	1.5289	58.70	VQ				
0+40	2.0146	70.52	VQ				
0+45	2.6507	92.37	VQ				
0+50	3.6614	146.76	V Q				
0+55	5.2656	232.92	V Q				
1+ 0	6.7622	217.31	V Q				
1+ 5	7.6438	128.00	Q V				
1+10	8.1653	75.73	Q V				
1+15	8.5019	48.87	Q V				
1+20	8.7420	34.87	Q V				
1+25	8.9216	26.08	Q V				
1+30	9.0570	19.66	Q V				
1+35	9.1656	15.77	Q V				
1+40	9.2501	12.26	Q V				
1+45	9.3154	9.49	Q V				
1+50	9.3653	7.23	Q V				
1+55	9.4027	5.44	Q V				
2+ 0	9.4327	4.36	Q V				
2+ 5	9.4537	3.05	Q V				
2+10	9.4583	0.67	Q V				
2+15	9.4594	0.17	Q V				

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: EXA010310.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271 Sq. Mi.
Length along longest watercourse =    4753.00(Ft.)
Length along longest watercourse measured to centroid =    1892.00(Ft.)
Length along longest watercourse =      0.900 Mi.
Length along longest watercourse measured to centroid =      0.358 Mi.
Difference in elevation =     254.00(Ft.)
Slope along watercourse =    282.1628 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.160 Hr.
Lag time =     9.62 Min.
25% of lag time =     2.40 Min.
40% of lag time =     3.85 Min.
Unit time =     5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           0.85                147.22

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           2.00                346.40

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    2.000(In)

Point rain (area averaged) =    1.323(In)
Areal adjustment factor =   99.92 %
Adjusted average point rain =    1.322(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200           83.70         0.000
 Total Area Entered =    173.20(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
83.7	83.7	0.202	0.000	0.202	1.000	0.202
					Sum (F) =	0.202

Area averaged mean soil loss (F) (In/Hr) = 0.202
Minimum soil loss rate ((In/Hr)) = 0.101
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	51.976	6.505	11.355
2	0.167	103.953	27.811	48.545
3	0.250	155.929	28.601	49.924
4	0.333	207.905	12.284	21.442
5	0.417	259.881	6.621	11.557
6	0.500	311.858	4.609	8.046
7	0.583	363.834	3.310	5.778
8	0.667	415.810	2.482	4.332
9	0.750	467.787	1.808	3.156
10	0.833	519.763	1.552	2.709
11	0.917	571.739	1.205	2.104
12	1.000	623.715	0.949	1.657
13	1.083	675.692	0.733	1.279
14	1.167	727.668	0.546	0.954
15	1.250	779.644	0.520	0.907
16	1.333	831.621	0.463	0.809
		Sum = 100.000	Sum=	174.553

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.206	(0.202)	0.186	0.021
2	0.17	1.30	0.206	(0.202)	0.186	0.021
3	0.25	1.10	0.175	(0.202)	0.157	0.017
4	0.33	1.50	0.238	0.202	(0.214)	0.036
5	0.42	1.50	0.238	0.202	(0.214)	0.036
6	0.50	1.80	0.286	0.202	(0.257)	0.084
7	0.58	1.50	0.238	0.202	(0.214)	0.036
8	0.67	1.80	0.286	0.202	(0.257)	0.084
9	0.75	1.80	0.286	0.202	(0.257)	0.084
10	0.83	1.50	0.238	0.202	(0.214)	0.036
11	0.92	1.60	0.254	0.202	(0.228)	0.052
12	1.00	1.80	0.286	0.202	(0.257)	0.084
13	1.08	2.20	0.349	0.202	(0.314)	0.147
14	1.17	2.20	0.349	0.202	(0.314)	0.147
15	1.25	2.20	0.349	0.202	(0.314)	0.147
16	1.33	2.00	0.317	0.202	(0.286)	0.115
17	1.42	2.60	0.413	0.202	(0.371)	0.211
18	1.50	2.70	0.428	0.202	(0.386)	0.227
19	1.58	2.40	0.381	0.202	(0.343)	0.179
20	1.67	2.70	0.428	0.202	(0.386)	0.227
21	1.75	3.30	0.524	0.202	(0.471)	0.322
22	1.83	3.10	0.492	0.202	(0.443)	0.290
23	1.92	2.90	0.460	0.202	(0.414)	0.258
24	2.00	3.00	0.476	0.202	(0.428)	0.274
25	2.08	3.10	0.492	0.202	(0.443)	0.290
26	2.17	4.20	0.666	0.202	(0.600)	0.465
27	2.25	5.00	0.793	0.202	(0.714)	0.591
28	2.33	3.50	0.555	0.202	(0.500)	0.353
29	2.42	6.80	1.079	0.202	(0.971)	0.877
30	2.50	7.30	1.158	0.202	(1.042)	0.956

```
31   2.58     8.20      1.301          0.202    (  1.171)        1.099
32   2.67     5.90      0.936          0.202    (  0.842)        0.734
33   2.75     2.00      0.317          0.202    (  0.286)        0.115
34   2.83     1.80      0.286          0.202    (  0.257)        0.084
35   2.92     1.80      0.286          0.202    (  0.257)        0.084
36   3.00     0.60      0.095       (  0.202)       0.086        0.010
            (Loss Rate Not Used)
   Sum =     100.0                                   Sum =     8.8
      Flood volume = Effective rainfall      0.73(In)
       times area     173.2(Ac.)/[(In)/(Ft.)] =      10.6(Ac.Ft)
      Total soil loss =      0.59(In)
      Total soil loss =     8.506(Ac.Ft)
      Total rainfall =      1.32(In)
      Flood volume =      460700.5 Cubic Feet
      Total soil loss =      370535.4 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    144.648(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------------
  0+ 5       0.0016      0.23  Q         |         |         |         |
  0+10       0.0101      1.24  Q         |         |         |         |
  0+15       0.0255      2.23  Q         |         |         |         |
  0+20       0.0443      2.73  Q         |         |         |         |
  0+25       0.0699      3.72  Q         |         |         |         |
  0+30       0.1064      5.29  VQ        |         |         |         |
  0+35       0.1584      7.55  VQ        |         |         |         |
  0+40       0.2164      8.43  VQ        |         |         |         |
  0+45       0.2825      9.59  |Q        |         |         |         |
  0+50       0.3589     11.10  |VQ       |         |         |         |
  0+55       0.4274      9.94  |Q        |         |         |         |
  1+ 0       0.4909      9.22  |Q        |         |         |         |
  1+ 5       0.5711     11.64  | Q       |         |         |         |
  1+10       0.6838     16.37  | VQ      |         |         |         |
  1+15       0.8233     20.25  |  VQ     |         |         |         |
  1+20       0.9722     21.63  |  VQ     |         |         |         |
  1+25       1.1249     22.17  |   Q     |         |         |         |
  1+30       1.3047     26.10  |   VQ    |         |         |         |
  1+35       1.5175     30.90  |    VQ   |         |         |         |
  1+40       1.7377     31.98  |     Q   |         |         |         |
  1+45       1.9751     34.46  |     QV  |         |         |         |
  1+50       2.2578     41.06  |       Q |         |         |         |
  1+55       2.5686     45.12  |        Q|         |         |         |
  2+ 0       2.8778     44.90  |       Q V         |         |         |
  2+ 5       3.1889     45.17  |        Q| V       |         |         |
  2+10       3.5253     48.85  |        Q|  V      |         |         |
  2+15       3.9396     60.16  |         | Q V     |         |         |
  2+20       4.4427     73.05  |         |   Q V   |         |         |
  2+25       4.9797     77.97  |         |    Q  V |         |         |
  2+30       5.6511     97.49  |         |         Q|V        |         |
  2+35       6.5268    127.15  |         |          |   VQ    |         |
  2+40       7.5230    144.65  |         |          |      Q  |         |
  2+45       8.4491    134.47  |         |          |     Q   |V        |
  2+50       9.0953     93.83  |         |        Q |         |   V     |
  2+55       9.5005     58.82  |         |Q         |         |    V    |
  3+ 0       9.7952     42.80  |       Q |          |         |      V  |
  3+ 5      10.0090     31.03  |     Q   |          |         |      V  |
  3+10      10.1579     21.63  |   Q     |          |         |       V |
  3+15      10.2673     15.88  |  Q      |          |         |       V |
  3+20      10.3513     12.21  | Q       |          |         |        V|
  3+25      10.4171      9.55  |Q        |          |         |        V|
  3+30      10.4669      7.22  |Q        |          |         |        V|
  3+35      10.5040      5.39  |Q        |          |         |        V|
  3+40      10.5329      4.19  Q         |          |         |        V|
  3+45      10.5533      2.96  Q         |          |         |        V|
  3+50      10.5666      1.93  Q         |          |         |        V|
```

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   3+55      10.5728      0.90  Q          |          |          |         V|
   4+ 0      10.5746      0.26  Q          |          |          |         V|
   4+ 5      10.5756      0.15  Q          |          |          |         V|
   4+10      10.5762      0.08  Q          |          |          |         V|
   4+15      10.5762      0.01  Q          |          |          |          V
------------------------------------------------------------------------------
```

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        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: EXA010610.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271 Sq. Mi.
Length along longest watercourse =    4753.00(Ft.)
Length along longest watercourse measured to centroid =    1892.00(Ft.)
Length along longest watercourse =      0.900 Mi.
Length along longest watercourse measured to centroid =      0.358 Mi.
Difference in elevation =     254.00(Ft.)
Slope along watercourse =    282.1628 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.160 Hr.
Lag time =     9.62 Min.
25% of lag time =     2.40 Min.
40% of lag time =     3.85 Min.
Unit time =     5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           1.20                 207.84

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           3.00                 519.60

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    1.200(In)
Area Averaged 100-Year Rainfall =    3.000(In)

Point rain (area averaged) =    1.941(In)
Areal adjustment factor =   99.94 %
Adjusted average point rain =    1.939(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200           83.70          0.000
 Total Area Entered =    173.20(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
83.7	83.7	0.202	0.000	0.202	1.000	0.202
					Sum (F) =	0.202

Area averaged mean soil loss (F) (In/Hr) = 0.202
Minimum soil loss rate ((In/Hr)) = 0.101
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	51.976	6.505	11.355
2	0.167	103.953	27.811	48.545
3	0.250	155.929	28.601	49.924
4	0.333	207.905	12.284	21.442
5	0.417	259.881	6.621	11.557
6	0.500	311.858	4.609	8.046
7	0.583	363.834	3.310	5.778
8	0.667	415.810	2.482	4.332
9	0.750	467.787	1.808	3.156
10	0.833	519.763	1.552	2.709
11	0.917	571.739	1.205	2.104
12	1.000	623.715	0.949	1.657
13	1.083	675.692	0.733	1.279
14	1.167	727.668	0.546	0.954
15	1.250	779.644	0.520	0.907
16	1.333	831.621	0.463	0.809
			Sum = 100.000	Sum= 174.553

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.116	(0.202)		0.105	0.012
2	0.17	0.60	0.140	(0.202)		0.126	0.014
3	0.25	0.60	0.140	(0.202)		0.126	0.014
4	0.33	0.60	0.140	(0.202)		0.126	0.014
5	0.42	0.60	0.140	(0.202)		0.126	0.014
6	0.50	0.70	0.163	(0.202)		0.147	0.016
7	0.58	0.70	0.163	(0.202)		0.147	0.016
8	0.67	0.70	0.163	(0.202)		0.147	0.016
9	0.75	0.70	0.163	(0.202)		0.147	0.016
10	0.83	0.70	0.163	(0.202)		0.147	0.016
11	0.92	0.70	0.163	(0.202)		0.147	0.016
12	1.00	0.80	0.186	(0.202)		0.168	0.019
13	1.08	0.80	0.186	(0.202)		0.168	0.019
14	1.17	0.80	0.186	(0.202)		0.168	0.019
15	1.25	0.80	0.186	(0.202)		0.168	0.019
16	1.33	0.80	0.186	(0.202)		0.168	0.019
17	1.42	0.80	0.186	(0.202)		0.168	0.019
18	1.50	0.80	0.186	(0.202)		0.168	0.019
19	1.58	0.80	0.186	(0.202)		0.168	0.019
20	1.67	0.80	0.186	(0.202)		0.168	0.019
21	1.75	0.80	0.186	(0.202)		0.168	0.019
22	1.83	0.80	0.186	(0.202)		0.168	0.019
23	1.92	0.80	0.186	(0.202)		0.168	0.019
24	2.00	0.90	0.209	(0.202)		0.189	0.021
25	2.08	0.80	0.186	(0.202)		0.168	0.019
26	2.17	0.90	0.209	(0.202)		0.189	0.021
27	2.25	0.90	0.209	(0.202)		0.189	0.021
28	2.33	0.90	0.209	(0.202)		0.189	0.021
29	2.42	0.90	0.209	(0.202)		0.189	0.021
30	2.50	0.90	0.209	(0.202)		0.189	0.021

```
 31   2.58     0.90      0.209       (  0.202)       0.189        0.021
 32   2.67     0.90      0.209       (  0.202)       0.189        0.021
 33   2.75     1.00      0.233          0.202    (  0.209)        0.031
 34   2.83     1.00      0.233          0.202    (  0.209)        0.031
 35   2.92     1.00      0.233          0.202    (  0.209)        0.031
 36   3.00     1.00      0.233          0.202    (  0.209)        0.031
 37   3.08     1.00      0.233          0.202    (  0.209)        0.031
 38   3.17     1.10      0.256          0.202    (  0.230)        0.054
 39   3.25     1.10      0.256          0.202    (  0.230)        0.054
 40   3.33     1.10      0.256          0.202    (  0.230)        0.054
 41   3.42     1.20      0.279          0.202    (  0.251)        0.077
 42   3.50     1.30      0.303          0.202    (  0.272)        0.101
 43   3.58     1.40      0.326          0.202    (  0.293)        0.124
 44   3.67     1.40      0.326          0.202    (  0.293)        0.124
 45   3.75     1.50      0.349          0.202    (  0.314)        0.147
 46   3.83     1.50      0.349          0.202    (  0.314)        0.147
 47   3.92     1.60      0.372          0.202    (  0.335)        0.171
 48   4.00     1.60      0.372          0.202    (  0.335)        0.171
 49   4.08     1.70      0.396          0.202    (  0.356)        0.194
 50   4.17     1.80      0.419          0.202    (  0.377)        0.217
 51   4.25     1.90      0.442          0.202    (  0.398)        0.240
 52   4.33     2.00      0.465          0.202    (  0.419)        0.264
 53   4.42     2.10      0.489          0.202    (  0.440)        0.287
 54   4.50     2.10      0.489          0.202    (  0.440)        0.287
 55   4.58     2.20      0.512          0.202    (  0.461)        0.310
 56   4.67     2.30      0.535          0.202    (  0.482)        0.333
 57   4.75     2.40      0.559          0.202    (  0.503)        0.357
 58   4.83     2.40      0.559          0.202    (  0.503)        0.357
 59   4.92     2.50      0.582          0.202    (  0.524)        0.380
 60   5.00     2.60      0.605          0.202    (  0.545)        0.403
 61   5.08     3.10      0.721          0.202    (  0.649)        0.520
 62   5.17     3.60      0.838          0.202    (  0.754)        0.636
 63   5.25     3.90      0.908          0.202    (  0.817)        0.706
 64   5.33     4.20      0.977          0.202    (  0.880)        0.776
 65   5.42     4.70      1.094          0.202    (  0.984)        0.892
 66   5.50     5.60      1.303          0.202    (  1.173)        1.101
 67   5.58     1.90      0.442          0.202    (  0.398)        0.240
 68   5.67     0.90      0.209       (  0.202)       0.189        0.021
 69   5.75     0.60      0.140       (  0.202)       0.126        0.014
 70   5.83     0.50      0.116       (  0.202)       0.105        0.012
 71   5.92     0.30      0.070       (  0.202)       0.063        0.007
 72   6.00     0.20      0.047       (  0.202)       0.042        0.005
             (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    10.5
      Flood volume = Effective rainfall      0.88(In)
       times area     173.2(Ac.)/[(In)/(Ft.)] =      12.6(Ac.Ft)
      Total soil loss =      1.06(In)
      Total soil loss =    15.348(Ac.Ft)
      Total rainfall =      1.94(In)
      Flood volume =      550741.1 Cubic Feet
      Total soil loss =      668577.7 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    140.069(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------------
  0+ 5       0.0009      0.13  Q         |         |         |         |
  0+10       0.0059      0.72  Q         |         |         |         |
  0+15       0.0157      1.42  Q         |         |         |         |
  0+20       0.0279      1.78  Q         |         |         |         |
  0+25       0.0415      1.97  Q         |         |         |         |
  0+30       0.0561      2.12  Q         |         |         |         |
  0+35       0.0720      2.31  Q         |         |         |         |
  0+40       0.0892      2.49  Q         |         |         |         |
  0+45       0.1070      2.59  Q         |         |         |         |
  0+50       0.1253      2.66  Q         |         |         |         |
```

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0+55      0.1440      2.71  Q          |          |          |          |
1+ 0      0.1631      2.77  Q          |          |          |          |
1+ 5      0.1831      2.91  Q          |          |          |          |
1+10      0.2041      3.05  Q          |          |          |          |
1+15      0.2256      3.12  Q          |          |          |          |
1+20      0.2474      3.16  Q          |          |          |          |
1+25      0.2693      3.19  Q          |          |          |          |
1+30      0.2914      3.20  Q          |          |          |          |
1+35      0.3136      3.22  Q          |          |          |          |
1+40      0.3358      3.23  QV         |          |          |          |
1+45      0.3580      3.23  QV         |          |          |          |
1+50      0.3803      3.24  QV         |          |          |          |
1+55      0.4027      3.24  QV         |          |          |          |
2+ 0      0.4252      3.27  QV         |          |          |          |
2+ 5      0.4484      3.36  QV         |          |          |          |
2+10      0.4717      3.39  QV         |          |          |          |
2+15      0.4954      3.44  QV         |          |          |          |
2+20      0.5198      3.53  QV         |          |          |          |
2+25      0.5444      3.58  QV         |          |          |          |
2+30      0.5692      3.60  QV         |          |          |          |
2+35      0.5940      3.61  QV         |          |          |          |
2+40      0.6190      3.62  QV         |          |          |          |
2+45      0.6448      3.75  Q V        |          |          |          |
2+50      0.6740      4.24  Q V        |          |          |          |
2+55      0.7066      4.74  Q V        |          |          |          |
3+ 0      0.7407      4.96  Q V        |          |          |          |
3+ 5      0.7757      5.07  |QV        |          |          |          |
3+10      0.8130      5.42  |QV        |          |          |          |
3+15      0.8585      6.61  |QV        |          |          |          |
3+20      0.9124      7.82  |QV        |          |          |          |
3+25      0.9717      8.61  |Q V       |          |          |          |
3+30      1.0427     10.31  | QV       |          |          |          |
3+35      1.1327     13.07  | QV       |          |          |          |
3+40      1.2430     16.01  |  Q       |          |          |          |
3+45      1.3692     18.32  |  QV      |          |          |          |
3+50      1.5103     20.49  |   Q      |          |          |          |
3+55      1.6658     22.58  |   QV     |          |          |          |
4+ 0      1.8359     24.69  |   QV     |          |          |          |
4+ 5      2.0200     26.73  |    QV    |          |          |          |
4+10      2.2203     29.08  |    Q V   |          |          |          |
4+15      2.4424     32.25  |     QV   |          |          |          |
4+20      2.6888     35.77  |      QV  |          |          |          |
4+25      2.9604     39.44  |      Q V |          |          |          |
4+30      3.2561     42.94  |       Q V|          |          |          |
4+35      3.5705     45.65  |        Q|V          |          |          |
4+40      3.9039     48.40  |         Q| V        |          |          |
4+45      4.2609     51.84  |          Q  V       |          |          |
4+50      4.6416     55.28  |          |Q  V      |          |          |
4+55      5.0407     57.94  |          |Q   V     |          |          |
5+ 0      5.4585     60.66  |          | Q    V   |          |          |
5+ 5      5.9071     65.14  |          |  Q    V  |          |          |
5+10      6.4196     74.42  |          |   Q     V|          |          |
5+15      7.0251     87.91  |          |      Q  | V        |          |
5+20      7.7223    101.23  |          |         Q   V       |          |
5+25      8.5065    113.87  |          |          | Q   V    |          |
5+30      9.3992    129.62  |          |          |    Q   V|          |
5+35     10.3639    140.07  |          |          |       Q | V        |
5+40     11.1318    111.50  |          |          | Q       |    V     |
5+45     11.5838     65.62  |          |  Q       |         |     V    |
5+50     11.8642     40.72  |        Q |          |         |      V   |
5+55     12.0645     29.09  |    Q     |          |         |       V  |
6+ 0     12.2142     21.74  |   Q      |          |         |       V  |
6+ 5     12.3276     16.46  |  Q       |          |         |        V|
6+10     12.4135     12.47  | Q        |          |         |        V|
6+15     12.4800      9.66  |Q         |          |         |        V|
6+20     12.5311      7.42  |Q         |          |         |        V|
6+25     12.5697      5.60  |Q         |          |         |        V|
6+30     12.5980      4.11  Q          |          |         |        V|
6+35     12.6182      2.93  Q          |          |         |        V|
6+40     12.6324      2.06  Q          |          |         |        V|
6+45     12.6406      1.19  Q          |          |         |        V|
6+50     12.6424      0.26  Q          |          |         |        V|
6+55     12.6428      0.06  Q          |          |         |        V|
```

```
   7+ 0      12.6430      0.03  Q         |         |         |        V|
   7+ 5      12.6432      0.02  Q         |         |         |        V|
   7+10      12.6432      0.01  Q         |         |         |        V|
   7+15      12.6433      0.00  Q         |         |         |        V|
-------------------------------------------------------------------------
```

```
              U n i t   H y d r o g r a p h   A n a l y s i s

              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                    Study date  11/08/21 File: EXA0102410.out


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      ----------------------------------------------------------------------

      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6406

      ----------------------------------------------------------------------
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ----------------------------------------------------------------------
      TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
      EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR  HOUR STORM
      HUNSAKER & ASSOCIATES
      BY: BRIAN LOWELL, PE
      ----------------------------------------------------------------------
      Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271
Sq. Mi.
      Length along longest watercourse =    4753.00(Ft.)
      Length along longest watercourse measured to centroid =    1892.00(Ft.)
      Length along longest watercourse =      0.900 Mi.
      Length along longest watercourse measured to centroid =      0.358 Mi.
      Difference in elevation =     254.00(Ft.)
      Slope along watercourse =    282.1628 Ft./Mi.
      Average Manning's 'N' = 0.030
      Lag time =    0.160 Hr.
      Lag time =     9.62 Min.
      25% of lag time =     2.40 Min.
      40% of lag time =     3.85 Min.
      Unit time =    15.00 Min.
      Duration of storm = 24 Hour(s)
      User Entered Base Flow =     0.00(CFS)

      2 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
            173.20            2.00              346.40

      100 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
            173.20            5.00              866.00

      STORM EVENT (YEAR) =   10.00
      Area Averaged 2-Year Rainfall =    2.000(In)
```

```
      Area Averaged 100-Year Rainfall =    5.000(In)

      Point rain (area averaged) =    3.234(In)
      Areal adjustment factor =   99.97 %
      Adjusted average point rain =    3.233(In)

      Sub-Area Data:
      Area(Ac.)         Runoff Index   Impervious %
         173.200           83.70         0.000
       Total Area Entered =    173.20(Ac.)


      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      83.7  83.7      0.202     0.000        0.202       1.000      0.202
                                                          Sum (F) =   0.202
      Area averaged mean soil loss (F) (In/Hr) =  0.202
      Minimum soil loss rate ((In/Hr)) =  0.101
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.900
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                        VALLEY S-Curve
      ------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------
          1   0.250        155.929         34.579            60.360
          2   0.500        311.858         46.572            81.293
          3   0.750        467.787         10.847            18.934
          4   1.000        623.715          4.704             8.211
          5   1.250        779.644          2.305             4.023
          6   1.500        935.573          0.992             1.732
                                  Sum = 100.000   Sum=     174.553
-------------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.026	(0.356)	0.023	0.003
2	0.50	0.30	0.039	(0.352)	0.035	0.004
3	0.75	0.30	0.039	(0.348)	0.035	0.004
4	1.00	0.40	0.052	(0.344)	0.047	0.005
5	1.25	0.30	0.039	(0.340)	0.035	0.004
6	1.50	0.30	0.039	(0.336)	0.035	0.004
7	1.75	0.30	0.039	(0.332)	0.035	0.004
8	2.00	0.40	0.052	(0.328)	0.047	0.005
9	2.25	0.40	0.052	(0.324)	0.047	0.005
10	2.50	0.40	0.052	(0.320)	0.047	0.005
11	2.75	0.50	0.065	(0.316)	0.058	0.006
12	3.00	0.50	0.065	(0.312)	0.058	0.006
13	3.25	0.50	0.065	(0.308)	0.058	0.006
14	3.50	0.50	0.065	(0.305)	0.058	0.006
15	3.75	0.50	0.065	(0.301)	0.058	0.006
16	4.00	0.60	0.078	(0.297)	0.070	0.008
17	4.25	0.60	0.078	(0.293)	0.070	0.008
18	4.50	0.70	0.091	(0.289)	0.081	0.009
19	4.75	0.70	0.091	(0.286)	0.081	0.009
20	5.00	0.80	0.103	(0.282)	0.093	0.010

21	5.25	0.60	0.078	(0.278)	0.070	0.008
22	5.50	0.70	0.091	(0.275)	0.081	0.009
23	5.75	0.80	0.103	(0.271)	0.093	0.010
24	6.00	0.80	0.103	(0.268)	0.093	0.010
25	6.25	0.90	0.116	(0.264)	0.105	0.012
26	6.50	0.90	0.116	(0.261)	0.105	0.012
27	6.75	1.00	0.129	(0.257)	0.116	0.013
28	7.00	1.00	0.129	(0.254)	0.116	0.013
29	7.25	1.00	0.129	(0.250)	0.116	0.013
30	7.50	1.10	0.142	(0.247)	0.128	0.014
31	7.75	1.20	0.155	(0.243)	0.140	0.016
32	8.00	1.30	0.168	(0.240)	0.151	0.017
33	8.25	1.50	0.194	(0.237)	0.175	0.019
34	8.50	1.50	0.194	(0.233)	0.175	0.019
35	8.75	1.60	0.207	(0.230)	0.186	0.021
36	9.00	1.70	0.220	(0.227)	0.198	0.022
37	9.25	1.90	0.246	(0.224)	0.221	0.025
38	9.50	2.00	0.259	0.220	(0.233)	0.038
39	9.75	2.10	0.272	0.217	(0.244)	0.054
40	10.00	2.20	0.285	0.214	(0.256)	0.070
41	10.25	1.50	0.194	(0.211)	0.175	0.019
42	10.50	1.50	0.194	(0.208)	0.175	0.019
43	10.75	2.00	0.259	0.205	(0.233)	0.054
44	11.00	2.00	0.259	0.202	(0.233)	0.057
45	11.25	1.90	0.246	0.199	(0.221)	0.047
46	11.50	1.90	0.246	0.196	(0.221)	0.050
47	11.75	1.70	0.220	0.193	(0.198)	0.027
48	12.00	1.80	0.233	0.190	(0.210)	0.042
49	12.25	2.50	0.323	0.187	(0.291)	0.136
50	12.50	2.60	0.336	0.185	(0.303)	0.152
51	12.75	2.80	0.362	0.182	(0.326)	0.180
52	13.00	2.90	0.375	0.179	(0.338)	0.196
53	13.25	3.40	0.440	0.176	(0.396)	0.263
54	13.50	3.40	0.440	0.174	(0.396)	0.266
55	13.75	2.30	0.297	0.171	(0.268)	0.126
56	14.00	2.30	0.297	0.169	(0.268)	0.129
57	14.25	2.70	0.349	0.166	(0.314)	0.183
58	14.50	2.60	0.336	0.163	(0.303)	0.173
59	14.75	2.60	0.336	0.161	(0.303)	0.175
60	15.00	2.50	0.323	0.158	(0.291)	0.165
61	15.25	2.40	0.310	0.156	(0.279)	0.154
62	15.50	2.30	0.297	0.154	(0.268)	0.144
63	15.75	1.90	0.246	0.151	(0.221)	0.094
64	16.00	1.90	0.246	0.149	(0.221)	0.097
65	16.25	0.40	0.052	(0.147)	0.047	0.005
66	16.50	0.40	0.052	(0.144)	0.047	0.005
67	16.75	0.30	0.039	(0.142)	0.035	0.004
68	17.00	0.30	0.039	(0.140)	0.035	0.004
69	17.25	0.50	0.065	(0.138)	0.058	0.006
70	17.50	0.50	0.065	(0.136)	0.058	0.006
71	17.75	0.50	0.065	(0.134)	0.058	0.006
72	18.00	0.40	0.052	(0.132)	0.047	0.005
73	18.25	0.40	0.052	(0.130)	0.047	0.005
74	18.50	0.40	0.052	(0.128)	0.047	0.005
75	18.75	0.30	0.039	(0.126)	0.035	0.004
76	19.00	0.20	0.026	(0.124)	0.023	0.003
77	19.25	0.30	0.039	(0.123)	0.035	0.004
78	19.50	0.40	0.052	(0.121)	0.047	0.005
79	19.75	0.30	0.039	(0.119)	0.035	0.004
80	20.00	0.20	0.026	(0.118)	0.023	0.003
81	20.25	0.30	0.039	(0.116)	0.035	0.004
82	20.50	0.30	0.039	(0.115)	0.035	0.004
83	20.75	0.30	0.039	(0.113)	0.035	0.004
84	21.00	0.20	0.026	(0.112)	0.023	0.003
85	21.25	0.30	0.039	(0.111)	0.035	0.004

```
 86  21.50     0.20      0.026       (  0.109)       0.023        0.003
 87  21.75     0.30      0.039       (  0.108)       0.035        0.004
 88  22.00     0.20      0.026       (  0.107)       0.023        0.003
 89  22.25     0.30      0.039       (  0.106)       0.035        0.004
 90  22.50     0.20      0.026       (  0.105)       0.023        0.003
 91  22.75     0.20      0.026       (  0.104)       0.023        0.003
 92  23.00     0.20      0.026       (  0.103)       0.023        0.003
 93  23.25     0.20      0.026       (  0.102)       0.023        0.003
 94  23.50     0.20      0.026       (  0.102)       0.023        0.003
 95  23.75     0.20      0.026       (  0.101)       0.023        0.003
 96  24.00     0.20      0.026       (  0.101)       0.023        0.003
            (Loss Rate Not Used)
    Sum =     100.0                                    Sum =     3.6
      Flood volume = Effective rainfall      0.90(In)
       times area     173.2(Ac.)/[(In)/(Ft.)] =      13.0(Ac.Ft)
      Total soil loss =      2.33(In)
      Total soil loss =    33.651(Ac.Ft)
      Total rainfall =      3.23(In)
      Flood volume =      566901.3 Cubic Feet
      Total soil loss =     1465819.4 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     43.514(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                 Hydrograph in  15   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
-------------------------------------------------------------------------
  0+15       0.0032      0.16  Q          |         |         |         |
  0+30       0.0124      0.44  Q          |         |         |         |
  0+45       0.0248      0.60  Q          |         |         |         |
  1+ 0       0.0397      0.72  Q          |         |         |         |
  1+15       0.0556      0.77  Q          |         |         |         |
  1+30       0.0701      0.70  Q          |         |         |         |
  1+45       0.0843      0.69  Q          |         |         |         |
  2+ 0       0.1000      0.76  Q          |         |         |         |
  2+15       0.1179      0.86  Q          |         |         |         |
  2+30       0.1362      0.89  Q          |         |         |         |
  2+45       0.1563      0.97  Q          |         |         |         |
  3+ 0       0.1787      1.08  Q          |         |         |         |
  3+15       0.2017      1.11  Q          |         |         |         |
  3+30       0.2248      1.12  Q          |         |         |         |
  3+45       0.2481      1.13  Q          |         |         |         |
  4+ 0       0.2731      1.21  Q          |         |         |         |
  4+15       0.3002      1.31  VQ         |         |         |         |
  4+30       0.3294      1.42   Q         |         |         |         |
  4+45       0.3611      1.53  |Q         |         |         |         |
  5+ 0       0.3949      1.64  |Q         |         |         |         |
  5+15       0.4280      1.60  |Q         |         |         |         |
  5+30       0.4589      1.50  |Q         |         |         |         |
  5+45       0.4929      1.65  |Q         |         |         |         |
  6+ 0       0.5293      1.76  |Q         |         |         |         |
  6+15       0.5678      1.86  |Q         |         |         |         |
  6+30       0.6087      1.98  |Q         |         |         |         |
  6+45       0.6519      2.09  |QV        |         |         |         |
  7+ 0       0.6975      2.21  |QV        |         |         |         |
  7+15       0.7438      2.24  |QV        |         |         |         |
  7+30       0.7919      2.33  |QV        |         |         |         |
  7+45       0.8439      2.52  | Q        |         |         |         |
  8+ 0       0.9003      2.73  | Q        |         |         |         |
  8+15       0.9628      3.02  | Q        |         |         |         |
```

8+30	1.0304	3.27	QV
8+45	1.1011	3.42	QV
9+ 0	1.1761	3.63	QV
9+15	1.2573	3.93	Q
9+30	1.3608	5.00	Q
9+45	1.5085	7.15	VQ
10+ 0	1.7093	9.72	V Q
10+15	1.8823	8.37	VQ
10+30	1.9799	4.72	Q V
10+45	2.1049	6.05	Q V
11+ 0	2.2845	8.69	QV
11+15	2.4665	8.81	Q
11+30	2.6405	8.42	Q V
11+45	2.7903	7.25	Q V
12+ 0	2.9222	6.38	Q V
12+15	3.1879	12.86	VQ
12+30	3.6323	21.51	V Q
12+45	4.1764	26.33	V Q
13+ 0	4.8106	30.70	V Q
13+15	5.5774	37.12	V Q
13+30	6.4765	43.51	V Q
13+45	7.2378	36.85	V Q
14+ 0	7.7825	26.37	Q V
14+15	8.3514	27.53	Q V
14+30	8.9784	30.35	Q V
14+45	9.6013	30.15	Q V
15+ 0	10.2157	29.74	Q V
15+15	10.8032	28.43	Q V
15+30	11.3573	26.82	Q V
15+45	11.8260	22.68	Q V
16+ 0	12.2079	18.48	Q V
16+15	12.4570	12.06	Q V
16+30	12.5436	4.19	Q V
16+45	12.5886	2.18	Q V
17+ 0	12.6142	1.24	Q V
17+15	12.6351	1.01	Q V
17+30	12.6568	1.05	Q V
17+45	12.6795	1.10	Q V
18+ 0	12.7009	1.04	Q V
18+15	12.7203	0.94	Q V
18+30	12.7394	0.92	Q V
18+45	12.7566	0.83	Q V
19+ 0	12.7699	0.64	Q V
19+15	12.7821	0.59	Q V
19+30	12.7974	0.74	Q V
19+45	12.8134	0.77	Q V
20+ 0	12.8261	0.62	Q V
20+15	12.8381	0.58	Q V
20+30	12.8517	0.66	Q V
20+45	12.8656	0.67	Q V
21+ 0	12.8778	0.59	Q V
21+15	12.8896	0.57	Q V
21+30	12.9015	0.57	Q V
21+45	12.9131	0.56	Q V
22+ 0	12.9249	0.57	Q V
22+15	12.9364	0.56	Q V
22+30	12.9482	0.57	Q V
22+45	12.9582	0.48	Q V
23+ 0	12.9678	0.46	Q V
23+15	12.9772	0.46	Q V
23+30	12.9866	0.45	Q V
23+45	12.9959	0.45	Q V
24+ 0	13.0053	0.45	Q V
24+15	13.0114	0.30	Q V
24+30	13.0131	0.09	Q V

```
   24+45      13.0139      0.04  Q          |          |          |         V|
   25+ 0      13.0142      0.01  Q          |          |          |         V|
   25+15      13.0143      0.00  Q          |          |          |          V
-------------------------------------------------------------------------------
```

- Area 'A' – 100 Year - Pre-Development Condition – Unit Hydrograph

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: EXA1001100.out


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------------------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271 Sq. Mi.
Length along longest watercourse =    4753.00(Ft.)
Length along longest watercourse measured to centroid =    1892.00(Ft.)
Length along longest watercourse =      0.900 Mi.
Length along longest watercourse measured to centroid =      0.358 Mi.
Difference in elevation =     254.00(Ft.)
Slope along watercourse =    282.1628 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.160 Hr.
Lag time =     9.62 Min.
25% of lag time =     2.40 Min.
40% of lag time =     3.85 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           0.55                 95.26

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           1.30                225.16

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.550(In)
Area Averaged 100-Year Rainfall =    1.300(In)

Point rain (area averaged) =    1.300(In)
Areal adjustment factor =   99.84 %
Adjusted average point rain =    1.298(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200           83.70         0.000
 Total Area Entered =    173.20(Ac.)
```

```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      83.7  93.2      0.088     0.000        0.088       1.000      0.088
                                                       Sum (F) =    0.088
      Area averaged mean soil loss (F) (In/Hr) =  0.088
      Minimum soil loss rate ((In/Hr)) =  0.044
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.900
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5300
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083         51.976          6.505             11.355
          2   0.167        103.953         27.811             48.545
          3   0.250        155.929         28.601             49.924
          4   0.333        207.905         12.284             21.442
          5   0.417        259.881          6.621             11.557
          6   0.500        311.858          4.609              8.046
          7   0.583        363.834          3.310              5.778
          8   0.667        415.810          2.482              4.332
          9   0.750        467.787          1.808              3.156
         10   0.833        519.763          1.552              2.709
         11   0.917        571.739          1.205              2.104
         12   1.000        623.715          0.949              1.657
         13   1.083        675.692          0.733              1.279
         14   1.167        727.668          0.546              0.954
         15   1.250        779.644          0.520              0.907
         16   1.333        831.621          0.463              0.809
                                    Sum = 100.000   Sum=     174.553
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
    1   0.08     3.40      0.530          0.088    (  0.477)        0.441
    2   0.17     4.70      0.732          0.088    (  0.659)        0.644
    3   0.25     4.70      0.732          0.088    (  0.659)        0.644
    4   0.33     5.10      0.794          0.088    (  0.715)        0.706
    5   0.42     5.80      0.903          0.088    (  0.813)        0.815
    6   0.50     5.90      0.919          0.088    (  0.827)        0.831
    7   0.58     7.10      1.106          0.088    (  0.995)        1.018
    8   0.67     8.70      1.355          0.088    (  1.220)        1.267
    9   0.75    13.20      2.056          0.088    (  1.850)        1.968
   10   0.83    29.70      4.626          0.088    (  4.163)        4.538
   11   0.92     7.70      1.199          0.088    (  1.079)        1.111
   12   1.00     4.00      0.623          0.088    (  0.561)        0.535
              (Loss Rate Not Used)
      Sum =     100.0                                  Sum =    14.5
        Flood volume = Effective rainfall      1.21(In)
         times area     173.2(Ac.)/[(In)/(Ft.)] =      17.5(Ac.Ft)
        Total soil loss =      0.09(In)
        Total soil loss =     1.272(Ac.Ft)
        Total rainfall =      1.30(In)
        Flood volume =      760632.9 Cubic Feet
        Total soil loss =       55415.0 Cubic Feet
        ---------------------------------------------------------------------
         Peak flow rate of this hydrograph =    389.432(CFS)
        ---------------------------------------------------------------------
        +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
        ---------------------------------------------------------------------
```

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 100.0 200.0 300.0 400.0
0+ 5	0.0345	5.02	Q | | | |
0+10	0.2326	28.76	V Q | | | |
0+15	0.6502	60.64	|V Q | | | |
0+20	1.2076	80.93	| V Q | | | |
0+25	1.8594	94.64	| V Q| | | |
0+30	2.6109	109.12	| V Q | | |
0+35	3.4578	122.97	| V | Q | | |
0+40	4.4344	141.80	| V Q | | |
0+45	5.6435	175.57	| | V Q | | |
0+50	7.4240	258.52	| | V | Q | |
0+55	10.1060	389.43	| | | V | | Q |
1+ 0	12.6278	366.16	| | | V | Q |
1+ 5	14.2032	228.74	| | | Q | V |
1+10	15.1621	139.23	| | Q | | V |
1+15	15.7675	87.91	| | Q | | | V |
1+20	16.1960	62.21	| Q | | | | V |
1+25	16.5154	46.39	| Q | | | | V |
1+30	16.7560	34.93	| Q | | | | V |
1+35	16.9473	27.77	| Q | | | | V |
1+40	17.0955	21.52	| Q | | | | V|
1+45	17.2100	16.63	|Q | | | | V|
1+50	17.2970	12.63	|Q | | | | V|
1+55	17.3621	9.45	Q | | | | V|
2+ 0	17.4135	7.46	Q | | | | V|
2+ 5	17.4492	5.19	Q | | | | V|
2+10	17.4587	1.38	Q | | | | V|
2+15	17.4617	0.43	Q | | | | V

```
U n i t   H y d r o g r a p h   A n a l y s i s

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                    Study date  05/18/21 File: EXA1003100.out


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      ------------------------------------------------------------------------

      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6406

      ------------------------------------------------------------------------
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ------------------------------------------------------------------------
      TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
      EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR 3 HOUR STORM
      HUNSAKER & ASSOCIATES, FEBRUARY 2019
      BY: BRIAN LOWELL, PE
      ------------------------------------------------------------------------
      Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271 Sq. Mi.
      Length along longest watercourse =    4753.00(Ft.)
      Length along longest watercourse measured to centroid =    1892.00(Ft.)
      Length along longest watercourse =      0.900 Mi.
      Length along longest watercourse measured to centroid =      0.358 Mi.
      Difference in elevation =     254.00(Ft.)
      Slope along watercourse =    282.1628 Ft./Mi.
      Average Manning's 'N' = 0.030
      Lag time =    0.160 Hr.
      Lag time =     9.62 Min.
      25% of lag time =     2.40 Min.
      40% of lag time =     3.85 Min.
      Unit time =     5.00 Min.
      Duration of storm = 3 Hour(s)
      User Entered Base Flow =     0.00(CFS)

      2 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
            173.20           0.85                147.22

      100 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
            173.20           2.00                346.40

      STORM EVENT (YEAR) =  100.00
      Area Averaged 2-Year Rainfall =    0.850(In)
      Area Averaged 100-Year Rainfall =    2.000(In)

      Point rain (area averaged) =    2.000(In)
      Areal adjustment factor =   99.92 %
      Adjusted average point rain =    1.998(In)

      Sub-Area Data:
      Area(Ac.)         Runoff Index   Impervious %
         173.200           83.70         0.000
       Total Area Entered =    173.20(Ac.)
```

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
83.7	93.2	0.088	0.000	0.088	1.000	0.088
					Sum (F) =	0.088

Area averaged mean soil loss (F) (In/Hr) = 0.088
Minimum soil loss rate ((In/Hr)) = 0.044
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	51.976	6.505	11.355
2	0.167	103.953	27.811	48.545
3	0.250	155.929	28.601	49.924
4	0.333	207.905	12.284	21.442
5	0.417	259.881	6.621	11.557
6	0.500	311.858	4.609	8.046
7	0.583	363.834	3.310	5.778
8	0.667	415.810	2.482	4.332
9	0.750	467.787	1.808	3.156
10	0.833	519.763	1.552	2.709
11	0.917	571.739	1.205	2.104
12	1.000	623.715	0.949	1.657
13	1.083	675.692	0.733	1.279
14	1.167	727.668	0.546	0.954
15	1.250	779.644	0.520	0.907
16	1.333	831.621	0.463	0.809
			Sum = 100.000	Sum= 174.553

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.312	0.088	(0.281)	0.224
2	0.17	1.30	0.312	0.088	(0.281)	0.224
3	0.25	1.10	0.264	0.088	(0.237)	0.176
4	0.33	1.50	0.360	0.088	(0.324)	0.272
5	0.42	1.50	0.360	0.088	(0.324)	0.272
6	0.50	1.80	0.432	0.088	(0.389)	0.344
7	0.58	1.50	0.360	0.088	(0.324)	0.272
8	0.67	1.80	0.432	0.088	(0.389)	0.344
9	0.75	1.80	0.432	0.088	(0.389)	0.344
10	0.83	1.50	0.360	0.088	(0.324)	0.272
11	0.92	1.60	0.384	0.088	(0.345)	0.296
12	1.00	1.80	0.432	0.088	(0.389)	0.344
13	1.08	2.20	0.528	0.088	(0.475)	0.439
14	1.17	2.20	0.528	0.088	(0.475)	0.439
15	1.25	2.20	0.528	0.088	(0.475)	0.439
16	1.33	2.00	0.480	0.088	(0.432)	0.391
17	1.42	2.60	0.624	0.088	(0.561)	0.535
18	1.50	2.70	0.648	0.088	(0.583)	0.559
19	1.58	2.40	0.576	0.088	(0.518)	0.487
20	1.67	2.70	0.648	0.088	(0.583)	0.559
21	1.75	3.30	0.791	0.088	(0.712)	0.703
22	1.83	3.10	0.743	0.088	(0.669)	0.655
23	1.92	2.90	0.695	0.088	(0.626)	0.607
24	2.00	3.00	0.719	0.088	(0.648)	0.631
25	2.08	3.10	0.743	0.088	(0.669)	0.655
26	2.17	4.20	1.007	0.088	(0.907)	0.919
27	2.25	5.00	1.199	0.088	(1.079)	1.111
28	2.33	3.50	0.839	0.088	(0.755)	0.751
29	2.42	6.80	1.631	0.088	(1.468)	1.543

```
30   2.50     7.30      1.751          0.088    (  1.576)        1.663
31   2.58     8.20      1.967          0.088    (  1.770)        1.878
32   2.67     5.90      1.415          0.088    (  1.273)        1.327
33   2.75     2.00      0.480          0.088    (  0.432)        0.391
34   2.83     1.80      0.432          0.088    (  0.389)        0.344
35   2.92     1.80      0.432          0.088    (  0.389)        0.344
36   3.00     0.60      0.144          0.088    (  0.130)        0.056
              (Loss Rate Not Used)
   Sum =     100.0                                  Sum =    20.8
      Flood volume = Effective rainfall      1.73(In)
       times area     173.2(Ac.)/[(In)/(Ft.)] =      25.0(Ac.Ft)
      Total soil loss =      0.26(In)
      Total soil loss =     3.816(Ac.Ft)
      Total rainfall =      2.00(In)
      Flood volume =     1090234.1 Cubic Feet
      Total soil loss =      166245.1 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    256.532(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
-------------------------------------------------------------------------
  0+ 5       0.0175      2.54  Q         |         |         |         |
  0+10       0.1098     13.40  VQ        |         |         |         |
  0+15       0.2753     24.03  V  Q      |         |         |         |
  0+20       0.4652     27.58  V  Q      |         |         |         |
  0+25       0.6886     32.43  |V  Q     |         |         |         |
  0+30       0.9559     38.81  |V   Q    |         |         |         |
  0+35       1.2609     44.29  | V  Q    |         |         |         |
  0+40       1.5839     46.90  | V   Q   |         |         |         |
  0+45       1.9251     49.54  |  V  Q   |         |         |         |
  0+50       2.2871     52.56  |  V   Q  |         |         |         |
  0+55       2.6408     51.36  |   V Q   |         |         |         |
  1+ 0       2.9899     50.69  |   V Q   |         |         |         |
  1+ 5       3.3665     54.68  |    V Q  |         |         |         |
  1+10       3.7942     62.09  |     V Q |         |         |         |
  1+15       4.2638     68.19  |     V  Q|         |         |         |
  1+20       4.7491     70.47  |      V Q|         |         |         |
  1+25       5.2403     71.31  |       VQ|         |         |         |
  1+30       5.7725     77.28  |        VQ         |         |         |
  1+35       6.3551     84.60  |         VQ        |         |         |
  1+40       6.9489     86.22  |          |Q       |         |         |
  1+45       7.5686     89.98  |          |QV      |         |         |
  1+50       8.2569     99.94  |          |  Q     |         |         |
  1+55       8.9876    106.09  |          |   Q    |         |         |
  2+ 0       9.7159    105.76  |          |   QV   |         |         |
  2+ 5      10.4471    106.16  |          |   Q V  |         |         |
  2+10      11.2165    111.72  |          |   Q  V |         |         |
  2+15      12.1037    128.81  |          |      Q V|        |         |
  2+20      13.1251    148.31  |          |        QV        |         |
  2+25      14.1977    155.74  |          |         Q V      |         |
  2+30      15.4735    185.25  |          |           |   Q  |         |
  2+35      17.0581    230.09  |          |           |     V  Q       |
  2+40      18.8249    256.53  |          |           |        V   Q   |
  2+45      20.4857    241.14  |          |           |          | Q   |
  2+50      21.7234    179.71  |          |           |  Q       |   V |
  2+55      22.5966    126.80  |          |     Q     |          |     V
  3+ 0      23.2894    100.59  |          |  Q        |          |      V
  3+ 5      23.7977     73.80  |         Q|           |          |       V
  3+10      24.1339     48.81  |      Q    |          |          |       V
  3+15      24.3700     34.28  |    Q      |          |          |       V
  3+20      24.5477     25.82  |  Q        |          |          |        V|
  3+25      24.6849     19.91  | Q         |          |          |        V|
  3+30      24.7885     15.04  | Q         |          |          |        V|
  3+35      24.8662     11.28  |Q          |          |          |        V|
  3+40      24.9263      8.73  |Q          |          |          |        V|
  3+45      24.9694      6.26  Q           |          |          |        V|
```

```
   3+50      24.9985      4.22  Q          |          |          |         V|
   3+55      25.0142      2.29  Q          |          |          |         V|
   4+ 0      25.0213      1.03  Q          |          |          |         V|
   4+ 5      25.0258      0.64  Q          |          |          |         V|
   4+10      25.0280      0.33  Q          |          |          |         V|
   4+15      25.0283      0.05  Q          |          |          |         V|
-------------------------------------------------------------------------
```

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        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: EXA1006100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271 Sq. Mi.
Length along longest watercourse =    4753.00(Ft.)
Length along longest watercourse measured to centroid =    1892.00(Ft.)
Length along longest watercourse =      0.900 Mi.
Length along longest watercourse measured to centroid =      0.358 Mi.
Difference in elevation =     254.00(Ft.)
Slope along watercourse =    282.1628 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.160 Hr.
Lag time =     9.62 Min.
25% of lag time =     2.40 Min.
40% of lag time =     3.85 Min.
Unit time =     5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           1.20                207.84

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      173.20           3.00                519.60

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.200(In)
Area Averaged 100-Year Rainfall =    3.000(In)

Point rain (area averaged) =    3.000(In)
Areal adjustment factor =   99.94 %
Adjusted average point rain =    2.998(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200           83.70          0.000
 Total Area Entered =    173.20(Ac.)
```

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
83.7	93.2	0.088	0.000	0.088	1.000	0.088
					Sum (F) =	0.088

Area averaged mean soil loss (F) (In/Hr) = 0.088
Minimum soil loss rate ((In/Hr)) = 0.044
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	51.976	6.505	11.355
2	0.167	103.953	27.811	48.545
3	0.250	155.929	28.601	49.924
4	0.333	207.905	12.284	21.442
5	0.417	259.881	6.621	11.557
6	0.500	311.858	4.609	8.046
7	0.583	363.834	3.310	5.778
8	0.667	415.810	2.482	4.332
9	0.750	467.787	1.808	3.156
10	0.833	519.763	1.552	2.709
11	0.917	571.739	1.205	2.104
12	1.000	623.715	0.949	1.657
13	1.083	675.692	0.733	1.279
14	1.167	727.668	0.546	0.954
15	1.250	779.644	0.520	0.907
16	1.333	831.621	0.463	0.809
			Sum = 100.000	Sum= 174.553

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.180	0.088	(0.162)	0.092
2	0.17	0.60	0.216	0.088	(0.194)	0.128
3	0.25	0.60	0.216	0.088	(0.194)	0.128
4	0.33	0.60	0.216	0.088	(0.194)	0.128
5	0.42	0.60	0.216	0.088	(0.194)	0.128
6	0.50	0.70	0.252	0.088	(0.227)	0.164
7	0.58	0.70	0.252	0.088	(0.227)	0.164
8	0.67	0.70	0.252	0.088	(0.227)	0.164
9	0.75	0.70	0.252	0.088	(0.227)	0.164
10	0.83	0.70	0.252	0.088	(0.227)	0.164
11	0.92	0.70	0.252	0.088	(0.227)	0.164
12	1.00	0.80	0.288	0.088	(0.259)	0.200
13	1.08	0.80	0.288	0.088	(0.259)	0.200
14	1.17	0.80	0.288	0.088	(0.259)	0.200
15	1.25	0.80	0.288	0.088	(0.259)	0.200
16	1.33	0.80	0.288	0.088	(0.259)	0.200
17	1.42	0.80	0.288	0.088	(0.259)	0.200
18	1.50	0.80	0.288	0.088	(0.259)	0.200
19	1.58	0.80	0.288	0.088	(0.259)	0.200
20	1.67	0.80	0.288	0.088	(0.259)	0.200
21	1.75	0.80	0.288	0.088	(0.259)	0.200
22	1.83	0.80	0.288	0.088	(0.259)	0.200
23	1.92	0.80	0.288	0.088	(0.259)	0.200
24	2.00	0.90	0.324	0.088	(0.291)	0.236
25	2.08	0.80	0.288	0.088	(0.259)	0.200
26	2.17	0.90	0.324	0.088	(0.291)	0.236
27	2.25	0.90	0.324	0.088	(0.291)	0.236
28	2.33	0.90	0.324	0.088	(0.291)	0.236
29	2.42	0.90	0.324	0.088	(0.291)	0.236

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 30   2.50     0.90      0.324          0.088    (  0.291)        0.236
 31   2.58     0.90      0.324          0.088    (  0.291)        0.236
 32   2.67     0.90      0.324          0.088    (  0.291)        0.236
 33   2.75     1.00      0.360          0.088    (  0.324)        0.272
 34   2.83     1.00      0.360          0.088    (  0.324)        0.272
 35   2.92     1.00      0.360          0.088    (  0.324)        0.272
 36   3.00     1.00      0.360          0.088    (  0.324)        0.272
 37   3.08     1.00      0.360          0.088    (  0.324)        0.272
 38   3.17     1.10      0.396          0.088    (  0.356)        0.308
 39   3.25     1.10      0.396          0.088    (  0.356)        0.308
 40   3.33     1.10      0.396          0.088    (  0.356)        0.308
 41   3.42     1.20      0.432          0.088    (  0.389)        0.344
 42   3.50     1.30      0.468          0.088    (  0.421)        0.380
 43   3.58     1.40      0.504          0.088    (  0.453)        0.416
 44   3.67     1.40      0.504          0.088    (  0.453)        0.416
 45   3.75     1.50      0.540          0.088    (  0.486)        0.452
 46   3.83     1.50      0.540          0.088    (  0.486)        0.452
 47   3.92     1.60      0.576          0.088    (  0.518)        0.488
 48   4.00     1.60      0.576          0.088    (  0.518)        0.488
 49   4.08     1.70      0.612          0.088    (  0.550)        0.523
 50   4.17     1.80      0.648          0.088    (  0.583)        0.559
 51   4.25     1.90      0.684          0.088    (  0.615)        0.595
 52   4.33     2.00      0.720          0.088    (  0.648)        0.631
 53   4.42     2.10      0.756          0.088    (  0.680)        0.667
 54   4.50     2.10      0.756          0.088    (  0.680)        0.667
 55   4.58     2.20      0.792          0.088    (  0.712)        0.703
 56   4.67     2.30      0.828          0.088    (  0.745)        0.739
 57   4.75     2.40      0.863          0.088    (  0.777)        0.775
 58   4.83     2.40      0.863          0.088    (  0.777)        0.775
 59   4.92     2.50      0.899          0.088    (  0.810)        0.811
 60   5.00     2.60      0.935          0.088    (  0.842)        0.847
 61   5.08     3.10      1.115          0.088    (  1.004)        1.027
 62   5.17     3.60      1.295          0.088    (  1.166)        1.207
 63   5.25     3.90      1.403          0.088    (  1.263)        1.315
 64   5.33     4.20      1.511          0.088    (  1.360)        1.423
 65   5.42     4.70      1.691          0.088    (  1.522)        1.603
 66   5.50     5.60      2.015          0.088    (  1.813)        1.927
 67   5.58     1.90      0.684          0.088    (  0.615)        0.595
 68   5.67     0.90      0.324          0.088    (  0.291)        0.236
 69   5.75     0.60      0.216          0.088    (  0.194)        0.128
 70   5.83     0.50      0.180          0.088    (  0.162)        0.092
 71   5.92     0.30      0.108          0.088    (  0.097)        0.020
 72   6.00     0.20      0.072       (  0.088)       0.065        0.007
             (Loss Rate Not Used)
    Sum =     100.0                                  Sum =    29.7
      Flood volume = Effective rainfall      2.47(In)
       times area     173.2(Ac.)/[(In)/(Ft.)] =      35.7(Ac.Ft)
      Total soil loss =      0.53(In)
      Total soil loss =     7.605(Ac.Ft)
      Total rainfall =      3.00(In)
      Flood volume =     1553759.7 Cubic Feet
      Total soil loss =      331265.3 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    255.639(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                       R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
-------------------------------------------------------------------------
  0+ 5       0.0072      1.04  Q         |         |         |         |
  0+10       0.0479      5.91  Q         |         |         |         |
  0+15       0.1321     12.24  VQ        |         |         |         |
  0+20       0.2424     16.00  V Q       |         |         |         |
  0+25       0.3652     17.84  V Q       |         |         |         |
  0+30       0.4988     19.40  V Q       |         |         |         |
  0+35       0.6501     21.97  V Q       |         |         |         |
  0+40       0.8179     24.37  V  Q      |         |         |         |
  0+45       0.9942     25.59  |V Q      |         |         |         |
```

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0+50      1.1757     26.37  |V Q      |         |         |         |
0+55      1.3613     26.95  |V Q      |         |         |         |
1+ 0      1.5527     27.79  |V Q      |         |         |         |
1+ 5      1.7584     29.87  |V Q      |         |         |         |
1+10      1.9782     31.92  | V Q     |         |         |         |
1+15      2.2049     32.90  | V Q     |         |         |         |
1+20      2.4356     33.50  | V Q     |         |         |         |
1+25      2.6689     33.88  | V Q     |         |         |         |
1+30      2.9040     34.13  |  VQ     |         |         |         |
1+35      3.1404     34.32  |  VQ     |         |         |         |
1+40      3.3778     34.47  |  VQ     |         |         |         |
1+45      3.6160     34.60  |   Q     |         |         |         |
1+50      3.8548     34.67  |   Q     |         |         |         |
1+55      4.0940     34.73  |   Q     |         |         |         |
2+ 0      4.3364     35.19  |   Q     |         |         |         |
2+ 5      4.5882     36.56  |   QV    |         |         |         |
2+10      4.8433     37.05  |   QV    |         |         |         |
2+15      5.1037     37.80  |    Q    |         |         |         |
2+20      5.3740     39.24  |    QV   |         |         |         |
2+25      5.6487     39.89  |    QV   |         |         |         |
2+30      5.9257     40.22  |    QV   |         |         |         |
2+35      6.2043     40.46  |    QV   |         |         |         |
2+40      6.4841     40.63  |    Q V  |         |         |         |
2+45      6.7677     41.18  |    Q V  |         |         |         |
2+50      7.0640     43.01  |    Q V  |         |         |         |
2+55      7.3731     44.89  |    Q  V |         |         |         |
3+ 0      7.6881     45.73  |     Q V |         |         |         |
3+ 5      8.0062     46.19  |     Q V |         |         |         |
3+10      8.3294     46.93  |     Q  V|         |         |         |
3+15      8.6663     48.92  |     Q  V|         |         |         |
3+20      9.0167     50.88  |     Q   V         |         |         |
3+25      9.3762     52.20  |     Q   V         |         |         |
3+30      9.7541     54.87  |      Q  V         |         |         |
3+35     10.1618     59.19  |      Q  |V        |         |         |
3+40     10.6010     63.77  |       Q |V        |         |         |
3+45     11.0649     67.37  |       Q | V       |         |         |
3+50     11.5521     70.74  |        Q| V       |         |         |
3+55     12.0617     73.99  |        Q|  V      |         |         |
4+ 0     12.5939     77.27  |         Q   V     |         |         |
4+ 5     13.1478     80.43  |         Q   V     |         |         |
4+10     13.7267     84.06  |         |Q   V    |         |         |
4+15     14.3393     88.96  |         |Q    V   |         |         |
4+20     14.9894     94.39  |         | Q   V   |         |         |
4+25     15.6786    100.07  |         |  Q   V  |         |         |
4+30     16.4051    105.48  |         |   Q   V |         |         |
4+35     17.1604    109.68  |         |   Q    V|         |         |
4+40     17.9450    113.93  |         |    Q    V         |         |
4+45     18.7663    119.25  |         |    Q    |V        |         |
4+50     19.6241    124.55  |         |     Q   | V       |         |
4+55     20.5103    128.67  |         |      Q  |  V      |         |
5+ 0     21.4254    132.87  |         |      Q  |   V     |         |
5+ 5     22.3882    139.80  |         |       Q |    V    |         |
5+10     23.4498    154.15  |         |         Q     V   |         |
5+15     24.6551    175.01  |         |         |  Q   V  |         |
5+20     26.0022    195.60  |         |         |     Q  V|         |
5+25     27.4839    215.14  |         |         |       Q V         |
5+30     29.1332    239.49  |         |         |         |QV       |
5+35     30.8938    255.64  |         |         |         |   Q     |
5+40     32.3487    211.25  |         |         |       Q |     V   |
5+45     33.3005    138.20  |         |         Q         |      V  |
5+50     33.9451     93.60  |         | Q       |         |       V |
5+55     34.4136     68.02  |         Q|        |         |       V |
6+ 0     34.7542     49.46  |      Q   |        |         |       V |
6+ 5     34.9997     35.65  |    Q     |        |         |        V|
6+10     35.1813     26.37  |  Q       |        |         |        V|
6+15     35.3202     20.17  | Q        |        |         |        V|
6+20     35.4263     15.40  | Q        |        |         |        V|
6+25     35.5064     11.64  |Q         |        |         |        V|
6+30     35.5657      8.60  |Q         |        |         |        V|
6+35     35.6084      6.21  Q          |        |         |        V|
6+40     35.6387      4.40  Q          |        |         |        V|
6+45     35.6573      2.70  Q          |        |         |        V|
6+50     35.6641      0.98  Q          |        |         |        V|
```

```
   6+55      35.6671      0.43  Q         |         |         |        V|
   7+ 0      35.6685      0.21  Q         |         |         |        V|
   7+ 5      35.6692      0.10  Q         |         |         |        V|
   7+10      35.6694      0.02  Q         |         |         |        V|
   7+15      35.6694      0.01  Q         |         |         |        V|
-------------------------------------------------------------------------
```

```
              U n i t   H y d r o g r a p h   A n a l y s i s

              Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
                    Study date  11/08/21 File: EXA10024100.out


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      ------------------------------------------------------------------------

      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6406

      ------------------------------------------------------------------------
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ------------------------------------------------------------------------
      TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'A'
      EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR  HOUR STORM
      HUNSAKER & ASSOCIATES,
      BY: BRIAN LOWELL, PE
      ------------------------------------------------------------------------
      Drainage Area =     173.20(Ac.)  =      0.271 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =     173.20(Ac.)  =      0.271
Sq. Mi.
      Length along longest watercourse =    4753.00(Ft.)
      Length along longest watercourse measured to centroid =    1892.00(Ft.)
      Length along longest watercourse =      0.900 Mi.
      Length along longest watercourse measured to centroid =      0.358 Mi.
      Difference in elevation =     254.00(Ft.)
      Slope along watercourse =    282.1628 Ft./Mi.
      Average Manning's 'N' = 0.030
      Lag time =    0.160 Hr.
      Lag time =     9.62 Min.
      25% of lag time =     2.40 Min.
      40% of lag time =     3.85 Min.
      Unit time =    15.00 Min.
      Duration of storm = 24 Hour(s)
      User Entered Base Flow =     0.00(CFS)

      2 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
            173.20           2.00               346.40

      100 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
            173.20           5.00               866.00

      STORM EVENT (YEAR) =  100.00
      Area Averaged 2-Year Rainfall =    2.000(In)
      Area Averaged 100-Year Rainfall =    5.000(In)
```

```
Point rain (area averaged) =    5.000(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    4.998(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
   173.200           83.70         0.000
 Total Area Entered =    173.20(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
83.7  93.2      0.088     0.000        0.088       1.000      0.088
                                                   Sum (F) =   0.088
Area averaged mean soil loss (F) (In/Hr) =  0.088
Minimum soil loss rate ((In/Hr)) =  0.044
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------

             U n i t  H y d r o g r a p h
                    VALLEY S-Curve
------------------------------------------------------------------------
             Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.250        155.929         34.579            60.360
    2   0.500        311.858         46.572            81.293
    3   0.750        467.787         10.847            18.934
    4   1.000        623.715          4.704             8.211
    5   1.250        779.644          2.305             4.023
    6   1.500        935.573          0.992             1.732
                              Sum = 100.000   Sum=     174.553
------------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.25	0.20	0.040	(0.156)		0.036	0.004
2	0.50	0.30	0.060	(0.154)		0.054	0.006
3	0.75	0.30	0.060	(0.152)		0.054	0.006
4	1.00	0.40	0.080	(0.150)		0.072	0.008
5	1.25	0.30	0.060	(0.148)		0.054	0.006
6	1.50	0.30	0.060	(0.147)		0.054	0.006
7	1.75	0.30	0.060	(0.145)		0.054	0.006
8	2.00	0.40	0.080	(0.143)		0.072	0.008
9	2.25	0.40	0.080	(0.141)		0.072	0.008
10	2.50	0.40	0.080	(0.140)		0.072	0.008
11	2.75	0.50	0.100	(0.138)		0.090	0.010
12	3.00	0.50	0.100	(0.136)		0.090	0.010
13	3.25	0.50	0.100	(0.135)		0.090	0.010
14	3.50	0.50	0.100	(0.133)		0.090	0.010
15	3.75	0.50	0.100	(0.131)		0.090	0.010
16	4.00	0.60	0.120	(0.130)		0.108	0.012
17	4.25	0.60	0.120	(0.128)		0.108	0.012
18	4.50	0.70	0.140	(0.126)		0.126	0.014
19	4.75	0.70	0.140	0.125	(	0.126)	0.015
20	5.00	0.80	0.160	0.123	(	0.144)	0.037
21	5.25	0.60	0.120	(0.122)		0.108	0.012

22	5.50	0.70	0.140	0.120	(0.126)	0.020
23	5.75	0.80	0.160	0.118	(0.144)	0.042
24	6.00	0.80	0.160	0.117	(0.144)	0.043
25	6.25	0.90	0.180	0.115	(0.162)	0.065
26	6.50	0.90	0.180	0.114	(0.162)	0.066
27	6.75	1.00	0.200	0.112	(0.180)	0.088
28	7.00	1.00	0.200	0.111	(0.180)	0.089
29	7.25	1.00	0.200	0.109	(0.180)	0.091
30	7.50	1.10	0.220	0.108	(0.198)	0.112
31	7.75	1.20	0.240	0.106	(0.216)	0.134
32	8.00	1.30	0.260	0.105	(0.234)	0.155
33	8.25	1.50	0.300	0.103	(0.270)	0.197
34	8.50	1.50	0.300	0.102	(0.270)	0.198
35	8.75	1.60	0.320	0.100	(0.288)	0.219
36	9.00	1.70	0.340	0.099	(0.306)	0.241
37	9.25	1.90	0.380	0.098	(0.342)	0.282
38	9.50	2.00	0.400	0.096	(0.360)	0.304
39	9.75	2.10	0.420	0.095	(0.378)	0.325
40	10.00	2.20	0.440	0.094	(0.396)	0.346
41	10.25	1.50	0.300	0.092	(0.270)	0.208
42	10.50	1.50	0.300	0.091	(0.270)	0.209
43	10.75	2.00	0.400	0.090	(0.360)	0.310
44	11.00	2.00	0.400	0.088	(0.360)	0.312
45	11.25	1.90	0.380	0.087	(0.342)	0.293
46	11.50	1.90	0.380	0.086	(0.342)	0.294
47	11.75	1.70	0.340	0.084	(0.306)	0.256
48	12.00	1.80	0.360	0.083	(0.324)	0.277
49	12.25	2.50	0.500	0.082	(0.450)	0.418
50	12.50	2.60	0.520	0.081	(0.468)	0.439
51	12.75	2.80	0.560	0.079	(0.504)	0.480
52	13.00	2.90	0.580	0.078	(0.522)	0.502
53	13.25	3.40	0.680	0.077	(0.612)	0.603
54	13.50	3.40	0.680	0.076	(0.612)	0.604
55	13.75	2.30	0.460	0.075	(0.414)	0.385
56	14.00	2.30	0.460	0.074	(0.414)	0.386
57	14.25	2.70	0.540	0.072	(0.486)	0.467
58	14.50	2.60	0.520	0.071	(0.468)	0.448
59	14.75	2.60	0.520	0.070	(0.468)	0.450
60	15.00	2.50	0.500	0.069	(0.450)	0.431
61	15.25	2.40	0.480	0.068	(0.432)	0.412
62	15.50	2.30	0.460	0.067	(0.414)	0.393
63	15.75	1.90	0.380	0.066	(0.342)	0.314
64	16.00	1.90	0.380	0.065	(0.342)	0.315
65	16.25	0.40	0.080	0.064	(0.072)	0.016
66	16.50	0.40	0.080	0.063	(0.072)	0.017
67	16.75	0.30	0.060	(0.062)	0.054	0.006
68	17.00	0.30	0.060	(0.061)	0.054	0.006
69	17.25	0.50	0.100	0.060	(0.090)	0.040
70	17.50	0.50	0.100	0.059	(0.090)	0.041
71	17.75	0.50	0.100	0.058	(0.090)	0.041
72	18.00	0.40	0.080	0.058	(0.072)	0.022
73	18.25	0.40	0.080	0.057	(0.072)	0.023
74	18.50	0.40	0.080	0.056	(0.072)	0.024
75	18.75	0.30	0.060	(0.055)	0.054	0.006
76	19.00	0.20	0.040	(0.054)	0.036	0.004
77	19.25	0.30	0.060	0.054	(0.054)	0.006
78	19.50	0.40	0.080	0.053	(0.072)	0.027
79	19.75	0.30	0.060	0.052	(0.054)	0.008
80	20.00	0.20	0.040	(0.051)	0.036	0.004
81	20.25	0.30	0.060	0.051	(0.054)	0.009
82	20.50	0.30	0.060	0.050	(0.054)	0.010
83	20.75	0.30	0.060	0.049	(0.054)	0.011
84	21.00	0.20	0.040	(0.049)	0.036	0.004
85	21.25	0.30	0.060	0.048	(0.054)	0.012
86	21.50	0.20	0.040	(0.048)	0.036	0.004

```
87  21.75     0.30      0.060          0.047    (  0.054)        0.013
88  22.00     0.20      0.040       (  0.047)       0.036        0.004
89  22.25     0.30      0.060          0.046    (  0.054)        0.014
90  22.50     0.20      0.040       (  0.046)       0.036        0.004
91  22.75     0.20      0.040       (  0.045)       0.036        0.004
92  23.00     0.20      0.040       (  0.045)       0.036        0.004
93  23.25     0.20      0.040       (  0.045)       0.036        0.004
94  23.50     0.20      0.040       (  0.044)       0.036        0.004
95  23.75     0.20      0.040       (  0.044)       0.036        0.004
96  24.00     0.20      0.040       (  0.044)       0.036        0.004
          (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    12.8
     Flood volume = Effective rainfall      3.21(In)
      times area     173.2(Ac.)/[(In)/(Ft.)] =      46.3(Ac.Ft)
     Total soil loss =      1.79(In)
     Total soil loss =    25.820(Ac.Ft)
     Total rainfall =      5.00(In)
     Flood volume =     2017804.7 Cubic Feet
     Total soil loss =     1124711.9 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =    101.432(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                   R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------------
  0+15       0.0050      0.24  Q          |          |          |          |
  0+30       0.0192      0.69  Q          |          |          |          |
  0+45       0.0383      0.93  Q          |          |          |          |
  1+ 0       0.0614      1.12  Q          |          |          |          |
  1+15       0.0860      1.19  Q          |          |          |          |
  1+30       0.1084      1.08  Q          |          |          |          |
  1+45       0.1304      1.06  Q          |          |          |          |
  2+ 0       0.1547      1.18  Q          |          |          |          |
  2+15       0.1822      1.33  Q          |          |          |          |
  2+30       0.2105      1.37  Q          |          |          |          |
  2+45       0.2416      1.51  Q          |          |          |          |
  3+ 0       0.2763      1.68  Q          |          |          |          |
  3+15       0.3118      1.72  Q          |          |          |          |
  3+30       0.3476      1.73  Q          |          |          |          |
  3+45       0.3836      1.74  Q          |          |          |          |
  4+ 0       0.4222      1.87  Q          |          |          |          |
  4+15       0.4641      2.03  Q          |          |          |          |
  4+30       0.5093      2.19  Q          |          |          |          |
  4+45       0.5596      2.44  Q          |          |          |          |
  5+ 0       0.6399      3.88  Q          |          |          |          |
  5+15       0.7264      4.19  Q          |          |          |          |
  5+30       0.7900      3.08  Q          |          |          |          |
  5+45       0.8880      4.75  Q          |          |          |          |
  6+ 0       1.0250      6.63  VQ         |          |          |          |
  6+15       1.2000      8.47   Q         |          |          |          |
  6+30       1.4172     10.51  |VQ        |          |          |          |
  6+45       1.6745     12.46  |VQ        |          |          |          |
  7+ 0       1.9751     14.55  |VQ        |          |          |          |
  7+15       2.2907     15.27  |V Q       |          |          |          |
  7+30       2.6407     16.94  | VQ       |          |          |          |
  7+45       3.0563     20.12  | V Q      |          |          |          |
  8+ 0       3.5443     23.62  |  VQ      |          |          |          |
  8+15       4.1323     28.46  |  V Q     |          |          |          |
  8+30       4.8057     32.59  |   V Q    |          |          |          |
```

```
 8+45      5.5306     35.09  |   V  Q  |         |         |         |
 9+ 0      6.3283     38.61  |    V Q  |         |         |         |
 9+15      7.2265     43.47  |     V Q |         |         |         |
 9+30      8.2346     48.79  |      V Q|         |         |         |
 9+45      9.3270     52.87  |       V Q         |         |         |
10+ 0     10.4998     56.77  |        V|Q        |         |         |
10+15     11.5518     50.92  |         VQ        |         |         |
10+30     12.3878     40.46  |        Q V        |         |         |
10+45     13.3043     44.36  |        Q  V       |         |         |
11+ 0     14.3722     51.69  |          Q V      |         |         |
11+15     15.4481     52.07  |          Q  V     |         |         |
11+30     16.5071     51.25  |          Q   V    |         |         |
11+45     17.5212     49.09  |         Q|    V    |         |         |
12+ 0     18.4979     47.27  |         Q|    V    |         |         |
12+15     19.6700     56.73  |          |Q    V   |         |         |
12+30     21.1070     69.55  |          |  Q    V |         |         |
12+45     22.6868     76.46  |          |    Q   V|         |         |
13+ 0     24.3950     82.67  |          |     Q    V        |         |
13+15     26.2971     92.06  |          |        Q | V      |         |
13+30     28.3928    101.43  |          |          Q   V    |         |
13+45     30.2649     90.61  |          |        Q |     V  |         |
14+ 0     31.7916     73.89  |          |   Q      |      V |         |
14+15     33.3452     75.19  |          |    Q     |       V|         |
14+30     34.9785     79.05  |          |    Q     |        V        |
14+45     36.5952     78.25  |          |    Q     |         V       |
15+ 0     38.1887     77.13  |          |    Q     |          V      |
15+15     39.7309     74.64  |          |   Q      |           V     |
15+30     41.2117     71.67  |          |   Q      |            V    |
15+45     42.5509     64.82  |          | Q        |             V   |
16+ 0     43.7466     57.87  |          |Q         |              V  |
16+15     44.5346     38.14  |       Q  |          |               V |
16+30     44.8063     13.15  | Q        |          |               V |
16+45     44.9420      6.57  |Q         |          |               V |
17+ 0     45.0062      3.11  Q          |          |               V |
17+15     45.0837      3.75  Q          |          |               V |
17+30     45.2064      5.94  |Q         |          |                V|
17+45     45.3440      6.66  |Q         |          |                V|
18+ 0     45.4650      5.85  |Q         |          |                V|
18+15     45.5581      4.51  Q          |          |                V|
18+30     45.6477      4.34  Q          |          |                V|
18+45     45.7134      3.18  Q          |          |                V|
19+ 0     45.7451      1.54  Q          |          |                V|
19+15     45.7690      1.16  Q          |          |                V|
19+30     45.8190      2.42  Q          |          |                V|
19+45     45.8790      2.90  Q          |          |                V|
20+ 0     45.9095      1.47  Q          |          |                V|
20+15     45.9361      1.29  Q          |          |                V|
20+30     45.9694      1.61  Q          |          |                V|
20+45     46.0051      1.73  Q          |          |                V|
21+ 0     46.0338      1.39  Q          |          |                V|
21+15     46.0619      1.36  Q          |          |                V|
21+30     46.0911      1.41  Q          |          |                V|
21+45     46.1202      1.41  Q          |          |                V|
22+ 0     46.1510      1.49  Q          |          |                V|
22+15     46.1817      1.48  Q          |          |                V|
22+30     46.2142      1.58  Q          |          |                V|
22+45     46.2332      0.92  Q          |          |                V|
23+ 0     46.2496      0.79  Q          |          |                V|
23+15     46.2649      0.74  Q          |          |                V|
23+30     46.2796      0.72  Q          |          |                V|
23+45     46.2941      0.70  Q          |          |                V|
24+ 0     46.3085      0.70  Q          |          |                V|
24+15     46.3179      0.46  Q          |          |                V|
24+30     46.3206      0.13  Q          |          |                V|
24+45     46.3218      0.06  Q          |          |                V|
```

```
   25+ 0      46.3223      0.02  Q          |          |          |         V|
   25+15      46.3224      0.01  Q          |          |          |         V|
-------------------------------------------------------------------------------
```

- Area 'A' – 2 Year - Post-Development Condition – Unit Hydrograph

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        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: pra00212.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6407

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           0.55                 53.82

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           1.30                127.22

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    0.550(In)
Area Averaged 100-Year Rainfall =    1.300(In)

Point rain (area averaged) =    0.550(In)
Areal adjustment factor =   99.91 %
Adjusted average point rain =    0.550(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50         0.442
 Total Area Entered =     97.86(Ac.)
```

```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      70.5  51.6      0.556     0.442        0.335       1.000      0.335
                                                      Sum (F) =    0.335
      Area averaged mean soil loss (F) (In/Hr) =  0.335
      Minimum soil loss rate ((In/Hr)) =  0.167
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.546
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5200
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083         86.787         15.235             15.025
          2   0.167        173.573         46.393             45.755
          3   0.250        260.360         18.144             17.894
          4   0.333        347.147          7.825              7.718
          5   0.417        433.934          4.607              4.543
          6   0.500        520.720          2.894              2.854
          7   0.583        607.507          2.036              2.008
          8   0.667        694.294          1.334              1.316
          9   0.750        781.080          0.909              0.897
         10   0.833        867.867          0.623              0.615
                                  Sum = 100.000   Sum=      98.625
-------------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     4.10      0.270       (  0.335)       0.148        0.123
   2   0.17     4.60      0.303       (  0.335)       0.166        0.138
   3   0.25     4.50      0.297       (  0.335)       0.162        0.135
   4   0.33     4.90      0.323       (  0.335)       0.177        0.147
   5   0.42     5.50      0.363       (  0.335)       0.198        0.165
   6   0.50     6.40      0.422       (  0.335)       0.231        0.191
   7   0.58     7.10      0.468       (  0.335)       0.256        0.212
   8   0.67     9.00      0.593       (  0.335)       0.324        0.269
   9   0.75    12.90      0.851          0.335    (  0.465)        0.516
  10   0.83    29.50      1.945          0.335    (  1.063)        1.611
  11   0.92     7.00      0.462       (  0.335)       0.252        0.209
  12   1.00     4.50      0.297       (  0.335)       0.162        0.135
               (Loss Rate Not Used)
     Sum =     100.0                                  Sum =     3.8
        Flood volume = Effective rainfall      0.32(In)
         times area      97.9(Ac.)/[(In)/(Ft.)] =       2.6(Ac.Ft)
        Total soil loss =      0.23(In)
        Total soil loss =     1.865(Ac.Ft)
        Total rainfall =      0.55(In)
        Flood volume =      113968.4 Cubic Feet
        Total soil loss =       81235.9 Cubic Feet
        ------------------------------------------------------------------------
         Peak flow rate of this hydrograph =     90.443(CFS)
        ------------------------------------------------------------------------
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           1 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
        ------------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

        ------------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       25.0      50.0      75.0     100.0
  ------------------------------------------------------------------------
    0+ 5       0.0127      1.84  Q         |         |         |         |
```

```
   0+10       0.0656      7.68  |V Q      |          |          |          |
   0+15       0.1381     10.52  | V Q     |          |          |          |
   0+20       0.2192     11.78  |  VQ     |          |          |          |
   0+25       0.3102     13.21  |   VQ    |          |          |          |
   0+30       0.4138     15.05  |     Q   |          |          |          |
   0+35       0.5329     17.29  |     Q V |          |          |          |
   0+40       0.6704     19.96  |      Q  V          |          |          |
   0+45       0.8569     27.09  |         Q  V       |          |          |
   0+50       1.2448     56.31  |          |         V| Q       |          |
   0+55       1.8676     90.44  |          |          |       V |     Q    |
   1+ 0       2.1919     47.08  |          |        Q |          |  V       |
   1+ 5       2.3736     26.38  |          Q          |          |     V    |
   1+10       2.4694     13.92  |    Q     |          |          |      V   |
   1+15       2.5265      8.29  |  Q       |          |          |       V  |
   1+20       2.5643      5.50  | Q        |          |          |        V|
   1+25       2.5888      3.55  |Q         |          |          |        V|
   1+30       2.6047      2.31  Q          |          |          |        V|
   1+35       2.6141      1.36  Q          |          |          |        V|
   1+40       2.6158      0.25  Q          |          |          |        V|
   1+45       2.6164      0.08  Q          |          |          |        V|
-------------------------------------------------------------------------
```

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: pra00232.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6407

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
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PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =     5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           0.85                 83.18

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           2.00                195.72

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    2.000(In)

Point rain (area averaged) =    0.850(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    0.850(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50         0.442
 Total Area Entered =     97.86(Ac.)
```

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
70.5	51.6	0.556	0.442	0.335	1.000	0.335
					Sum (F) =	0.335

Area averaged mean soil loss (F) (In/Hr) = 0.335
Minimum soil loss rate ((In/Hr)) = 0.167
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	86.787	15.235	15.025
2	0.167	173.573	46.393	45.755
3	0.250	260.360	18.144	17.894
4	0.333	347.147	7.825	7.718
5	0.417	433.934	4.607	4.543
6	0.500	520.720	2.894	2.854
7	0.583	607.507	2.036	2.008
8	0.667	694.294	1.334	1.316
9	0.750	781.080	0.909	0.897
10	0.833	867.867	0.623	0.615
			Sum = 100.000	Sum= 98.625

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.133	(0.335)		0.072	0.060
2	0.17	1.30	0.133	(0.335)		0.072	0.060
3	0.25	1.10	0.112	(0.335)		0.061	0.051
4	0.33	1.50	0.153	(0.335)		0.084	0.069
5	0.42	1.50	0.153	(0.335)		0.084	0.069
6	0.50	1.80	0.184	(0.335)		0.100	0.083
7	0.58	1.50	0.153	(0.335)		0.084	0.069
8	0.67	1.80	0.184	(0.335)		0.100	0.083
9	0.75	1.80	0.184	(0.335)		0.100	0.083
10	0.83	1.50	0.153	(0.335)		0.084	0.069
11	0.92	1.60	0.163	(0.335)		0.089	0.074
12	1.00	1.80	0.184	(0.335)		0.100	0.083
13	1.08	2.20	0.224	(0.335)		0.123	0.102
14	1.17	2.20	0.224	(0.335)		0.123	0.102
15	1.25	2.20	0.224	(0.335)		0.123	0.102
16	1.33	2.00	0.204	(0.335)		0.111	0.093
17	1.42	2.60	0.265	(0.335)		0.145	0.120
18	1.50	2.70	0.275	(0.335)		0.150	0.125
19	1.58	2.40	0.245	(0.335)		0.134	0.111
20	1.67	2.70	0.275	(0.335)		0.150	0.125
21	1.75	3.30	0.336	(0.335)		0.184	0.153
22	1.83	3.10	0.316	(0.335)		0.173	0.143
23	1.92	2.90	0.296	(0.335)		0.162	0.134
24	2.00	3.00	0.306	(0.335)		0.167	0.139
25	2.08	3.10	0.316	(0.335)		0.173	0.143
26	2.17	4.20	0.428	(0.335)		0.234	0.194
27	2.25	5.00	0.510	(0.335)		0.279	0.231
28	2.33	3.50	0.357	(0.335)		0.195	0.162
29	2.42	6.80	0.693	0.335	(	0.379)	0.359
30	2.50	7.30	0.744	0.335	(	0.407)	0.410
31	2.58	8.20	0.836	0.335	(	0.457)	0.501
32	2.67	5.90	0.602	(0.335)		0.329	0.273
33	2.75	2.00	0.204	(0.335)		0.111	0.093
34	2.83	1.80	0.184	(0.335)		0.100	0.083
35	2.92	1.80	0.184	(0.335)		0.100	0.083
36	3.00	0.60	0.061	(0.335)		0.033	0.028

```
              (Loss Rate Not Used)
    Sum =     100.0                                    Sum =     4.9
       Flood volume = Effective rainfall      0.41(In)
        times area      97.9(Ac.)/[(In)/(Ft.)] =       3.3(Ac.Ft)
       Total soil loss =      0.44(In)
       Total soil loss =     3.623(Ac.Ft)
       Total rainfall =      0.85(In)
       Flood volume =      143985.5 Cubic Feet
       Total soil loss =      157832.2 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =     39.346(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
 ---------------------------------------------------------------------------
   0+ 5       0.0062      0.90  Q         |         |         |         |
   0+10       0.0314      3.66  V  Q      |         |         |         |
   0+15       0.0631      4.59  V   Q     |         |         |         |
   0+20       0.0969      4.91  |V  Q     |         |         |         |
   0+25       0.1373      5.87  |V   Q    |         |         |         |
   0+30       0.1821      6.51  | V   Q   |         |         |         |
   0+35       0.2314      7.16  | V    Q  |         |         |         |
   0+40       0.2804      7.11  |  V   Q  |         |         |         |
   0+45       0.3334      7.70  |   V  Q  |         |         |         |
   0+50       0.3868      7.75  |   V  Q  |         |         |         |
   0+55       0.4370      7.29  |    V Q  |         |         |         |
   1+ 0       0.4884      7.45  |    V Q  |         |         |         |
   1+ 5       0.5446      8.17  |     V Q |         |         |         |
   1+10       0.6079      9.18  |      V Q|         |         |         |
   1+15       0.6738      9.58  |       VQ|         |         |         |
   1+20       0.7400      9.61  |       VQ|         |         |         |
   1+25       0.8070      9.72  |        Q|         |         |         |
   1+30       0.8824     10.96  |         Q         |         |         |
   1+35       0.9611     11.43  |         |Q        |         |         |
   1+40       1.0389     11.29  |         |QV       |         |         |
   1+45       1.1233     12.26  |         | QV      |         |         |
   1+50       1.2171     13.62  |         |  QV     |         |         |
   1+55       1.3112     13.66  |         |  Q V    |         |         |
   2+ 0       1.4035     13.41  |         |  Q  V   |         |         |
   2+ 5       1.4973     13.62  |         |  Q    V |         |         |
   2+10       1.5984     14.68  |         |   Q    V|         |         |
   2+15       1.7202     17.68  |         |      Q  V         |         |
   2+20       1.8530     19.29  |         |        Q| V       |         |
   2+25       1.9919     20.16  |         |         Q   V     |         |
   2+30       2.1932     29.24  |         |           |    V  Q|         |
   2+35       2.4429     36.25  |         |           |       V|    Q    |
   2+40       2.7139     39.35  |         |           |        | V      Q|
   2+45       2.9140     29.05  |         |           |        Q|   V     |
   2+50       3.0381     18.02  |         |         Q |         |    V    |
   2+55       3.1313     13.54  |         |  Q        |         |     V   |
   3+ 0       3.2049     10.69  |         |Q          |         |      V  |
   3+ 5       3.2502      6.57  |     Q   |           |         |       V|
   3+10       3.2749      3.58  |  Q      |           |         |        V|
   3+15       3.2892      2.08  | Q       |           |         |        V|
   3+20       3.2975      1.21  |Q        |           |         |        V|
   3+25       3.3016      0.61  Q         |           |         |        V|
   3+30       3.3037      0.30  Q         |           |         |        V|
   3+35       3.3048      0.16  Q         |           |         |        V|
   3+40       3.3053      0.08  Q         |           |         |        V|
   3+45       3.3055      0.02  Q         |           |         |         V
---------------------------------------------------------------------------
```

```
        U n i t   H y d r o g r a p h   A n a l y s i s

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
               Study date  05/18/21 File: pra00262.out


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------------------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6407

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =     5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           1.20                117.43

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           3.00                293.58

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.200(In)
Area Averaged 100-Year Rainfall =    3.000(In)

Point rain (area averaged) =    1.200(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    1.200(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50         0.442
 Total Area Entered =     97.86(Ac.)
```

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
70.5	51.6	0.556	0.442	0.335	1.000	0.335
					Sum (F) =	0.335

Area averaged mean soil loss (F) (In/Hr) = 0.335
Minimum soil loss rate ((In/Hr)) = 0.167
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	86.787	15.235	15.025
2	0.167	173.573	46.393	45.755
3	0.250	260.360	18.144	17.894
4	0.333	347.147	7.825	7.718
5	0.417	433.934	4.607	4.543
6	0.500	520.720	2.894	2.854
7	0.583	607.507	2.036	2.008
8	0.667	694.294	1.334	1.316
9	0.750	781.080	0.909	0.897
10	0.833	867.867	0.623	0.615
			Sum = 100.000	Sum= 98.625

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.072	(0.335)		0.039	0.033
2	0.17	0.60	0.086	(0.335)		0.047	0.039
3	0.25	0.60	0.086	(0.335)		0.047	0.039
4	0.33	0.60	0.086	(0.335)		0.047	0.039
5	0.42	0.60	0.086	(0.335)		0.047	0.039
6	0.50	0.70	0.101	(0.335)		0.055	0.046
7	0.58	0.70	0.101	(0.335)		0.055	0.046
8	0.67	0.70	0.101	(0.335)		0.055	0.046
9	0.75	0.70	0.101	(0.335)		0.055	0.046
10	0.83	0.70	0.101	(0.335)		0.055	0.046
11	0.92	0.70	0.101	(0.335)		0.055	0.046
12	1.00	0.80	0.115	(0.335)		0.063	0.052
13	1.08	0.80	0.115	(0.335)		0.063	0.052
14	1.17	0.80	0.115	(0.335)		0.063	0.052
15	1.25	0.80	0.115	(0.335)		0.063	0.052
16	1.33	0.80	0.115	(0.335)		0.063	0.052
17	1.42	0.80	0.115	(0.335)		0.063	0.052
18	1.50	0.80	0.115	(0.335)		0.063	0.052
19	1.58	0.80	0.115	(0.335)		0.063	0.052
20	1.67	0.80	0.115	(0.335)		0.063	0.052
21	1.75	0.80	0.115	(0.335)		0.063	0.052
22	1.83	0.80	0.115	(0.335)		0.063	0.052
23	1.92	0.80	0.115	(0.335)		0.063	0.052
24	2.00	0.90	0.130	(0.335)		0.071	0.059
25	2.08	0.80	0.115	(0.335)		0.063	0.052
26	2.17	0.90	0.130	(0.335)		0.071	0.059
27	2.25	0.90	0.130	(0.335)		0.071	0.059
28	2.33	0.90	0.130	(0.335)		0.071	0.059
29	2.42	0.90	0.130	(0.335)		0.071	0.059
30	2.50	0.90	0.130	(0.335)		0.071	0.059
31	2.58	0.90	0.130	(0.335)		0.071	0.059
32	2.67	0.90	0.130	(0.335)		0.071	0.059
33	2.75	1.00	0.144	(0.335)		0.079	0.065
34	2.83	1.00	0.144	(0.335)		0.079	0.065
35	2.92	1.00	0.144	(0.335)		0.079	0.065
36	3.00	1.00	0.144	(0.335)		0.079	0.065

```
 37   3.08     1.00      0.144       (  0.335)       0.079        0.065
 38   3.17     1.10      0.158       (  0.335)       0.087        0.072
 39   3.25     1.10      0.158       (  0.335)       0.087        0.072
 40   3.33     1.10      0.158       (  0.335)       0.087        0.072
 41   3.42     1.20      0.173       (  0.335)       0.094        0.078
 42   3.50     1.30      0.187       (  0.335)       0.102        0.085
 43   3.58     1.40      0.202       (  0.335)       0.110        0.091
 44   3.67     1.40      0.202       (  0.335)       0.110        0.091
 45   3.75     1.50      0.216       (  0.335)       0.118        0.098
 46   3.83     1.50      0.216       (  0.335)       0.118        0.098
 47   3.92     1.60      0.230       (  0.335)       0.126        0.104
 48   4.00     1.60      0.230       (  0.335)       0.126        0.104
 49   4.08     1.70      0.245       (  0.335)       0.134        0.111
 50   4.17     1.80      0.259       (  0.335)       0.142        0.118
 51   4.25     1.90      0.274       (  0.335)       0.149        0.124
 52   4.33     2.00      0.288       (  0.335)       0.157        0.131
 53   4.42     2.10      0.302       (  0.335)       0.165        0.137
 54   4.50     2.10      0.302       (  0.335)       0.165        0.137
 55   4.58     2.20      0.317       (  0.335)       0.173        0.144
 56   4.67     2.30      0.331       (  0.335)       0.181        0.150
 57   4.75     2.40      0.345       (  0.335)       0.189        0.157
 58   4.83     2.40      0.345       (  0.335)       0.189        0.157
 59   4.92     2.50      0.360       (  0.335)       0.197        0.163
 60   5.00     2.60      0.374       (  0.335)       0.204        0.170
 61   5.08     3.10      0.446       (  0.335)       0.244        0.202
 62   5.17     3.60      0.518       (  0.335)       0.283        0.235
 63   5.25     3.90      0.561       (  0.335)       0.307        0.255
 64   5.33     4.20      0.605       (  0.335)       0.330        0.274
 65   5.42     4.70      0.677          0.335    (  0.370)       0.342
 66   5.50     5.60      0.806          0.335    (  0.440)       0.472
 67   5.58     1.90      0.274       (  0.335)       0.149        0.124
 68   5.67     0.90      0.130       (  0.335)       0.071        0.059
 69   5.75     0.60      0.086       (  0.335)       0.047        0.039
 70   5.83     0.50      0.072       (  0.335)       0.039        0.033
 71   5.92     0.30      0.043       (  0.335)       0.024        0.020
 72   6.00     0.20      0.029       (  0.335)       0.016        0.013
             (Loss Rate Not Used)
    Sum =     100.0                                   Sum =     6.7
      Flood volume = Effective rainfall      0.56(In)
       times area      97.9(Ac.)/[(In)/(Ft.)] =       4.5(Ac.Ft)
      Total soil loss =      0.64(In)
      Total soil loss =     5.249(Ac.Ft)
      Total rainfall =      1.20(In)
      Flood volume =      197498.9 Cubic Feet
      Total soil loss =      228635.9 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     34.395(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
-------------------------------------------------------------------------
  0+ 5       0.0034      0.49  Q         |         |         |         |
  0+10       0.0177      2.08  V Q       |         |         |         |
  0+15       0.0382      2.97  V Q       |         |         |         |
  0+20       0.0611      3.34  V  Q      |         |         |         |
  0+25       0.0855      3.54  V  Q      |         |         |         |
  0+30       0.1114      3.76  V  Q      |         |         |         |
  0+35       0.1399      4.14  |V  Q     |         |         |         |
  0+40       0.1696      4.31  |V  Q     |         |         |         |
  0+45       0.1999      4.40  |V  Q     |         |         |         |
  0+50       0.2306      4.46  | V Q     |         |         |         |
  0+55       0.2614      4.48  | V Q     |         |         |         |
  1+ 0       0.2931      4.59  | V Q     |         |         |         |
  1+ 5       0.3268      4.90  | V Q     |         |         |         |
  1+10       0.3614      5.02  |  V Q    |         |         |         |
  1+15       0.3963      5.08  |  V Q    |         |         |         |
  1+20       0.4315      5.11  |  V Q    |         |         |         |
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   1+25       0.4668      5.12  |   VQ    |         |         |         |
   1+30       0.5022      5.14  |   VQ    |         |         |         |
   1+35       0.5376      5.15  |   VQ    |         |         |         |
   1+40       0.5731      5.15  |    Q    |         |         |         |
   1+45       0.6086      5.16  |    Q    |         |         |         |
   1+50       0.6441      5.16  |    Q    |         |         |         |
   1+55       0.6796      5.16  |    Q    |         |         |         |
   2+ 0       0.7158      5.25  |    QV   |         |         |         |
   2+ 5       0.7533      5.45  |    QV   |         |         |         |
   2+10       0.7903      5.37  |    QV   |         |         |         |
   2+15       0.8289      5.60  |    Q V  |         |         |         |
   2+20       0.8682      5.70  |    Q V  |         |         |         |
   2+25       0.9077      5.74  |    Q  V |         |         |         |
   2+30       0.9474      5.76  |    Q  V |         |         |         |
   2+35       0.9872      5.78  |    Q  V |         |         |         |
   2+40       1.0270      5.79  |    Q   V|         |         |         |
   2+45       1.0676      5.89  |    Q   V|         |         |         |
   2+50       1.1102      6.19  |     Q  V|         |         |         |
   2+55       1.1537      6.31  |     Q   V         |         |         |
   3+ 0       1.1976      6.36  |     Q   V         |         |         |
   3+ 5       1.2416      6.39  |     Q   V         |         |         |
   3+10       1.2864      6.51  |     Q   |V        |         |         |
   3+15       1.3334      6.82  |     Q   |V        |         |         |
   3+20       1.3813      6.95  |     Q   | V       |         |         |
   3+25       1.4302      7.10  |      Q  | V       |         |         |
   3+30       1.4821      7.53  |      Q  |  V      |         |         |
   3+35       1.5376      8.07  |       Q |  V      |         |         |
   3+40       1.5965      8.55  |       Q |   V     |         |         |
   3+45       1.6574      8.85  |       Q |   V     |         |         |
   3+50       1.7212      9.25  |        Q|    V    |         |         |
   3+55       1.7868      9.53  |        Q|    V    |         |         |
   4+ 0       1.8552      9.92  |        Q|     V   |         |         |
   4+ 5       1.9254     10.20  |         Q     V   |         |         |
   4+10       1.9990     10.68  |         Q      V  |         |         |
   4+15       2.0764     11.25  |          |Q      V |         |         |
   4+20       2.1580     11.84  |          |Q       V|         |         |
   4+25       2.2438     12.46  |          | Q      V|         |         |
   4+30       2.3332     12.98  |          | Q       V         |         |
   4+35       2.4249     13.32  |          |  Q      |V        |         |
   4+40       2.5202     13.84  |          |  Q      | V       |         |
   4+45       2.6196     14.43  |          |   Q     |  V      |         |
   4+50       2.7225     14.94  |          |   Q     |   V     |         |
   4+55       2.8277     15.27  |          |    Q    |   V     |         |
   5+ 0       2.9364     15.79  |          |    Q    |    V    |         |
   5+ 5       3.0519     16.76  |          |     Q   |     V   |         |
   5+10       3.1824     18.96  |          |       Q |       V |         |
   5+15       3.3301     21.44  |          |         |Q       V|         |
   5+20       3.4922     23.54  |          |         |  Q      V         |
   5+25       3.6730     26.25  |          |         |     Q   | V       |
   5+30       3.8938     32.06  |          |         |         | Q V     |
   5+35       4.1307     34.40  |          |         |         |   Q V   |
   5+40       4.2726     20.61  |          |         Q         |     V   |
   5+45       4.3593     12.59  |          | Q       |         |       V |
   5+50       4.4188      8.64  |       Q  |         |         |       V |
   5+55       4.4620      6.28  |     Q    |         |         |        V|
   6+ 0       4.4924      4.40  |   Q      |         |         |        V|
   6+ 5       4.5123      2.89  | Q        |         |         |        V|
   6+10       4.5230      1.56  |Q         |         |         |        V|
   6+15       4.5288      0.84  Q          |         |         |        V|
   6+20       4.5313      0.36  Q          |         |         |        V|
   6+25       4.5326      0.19  Q          |         |         |        V|
   6+30       4.5334      0.11  Q          |         |         |        V|
   6+35       4.5337      0.05  Q          |         |         |        V|
   6+40       4.5339      0.02  Q          |         |         |        V|
   6+45       4.5340      0.01  Q          |         |         |         V
-------------------------------------------------------------------------
```

```
              U n i t   H y d r o g r a p h   A n a l y s i s

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                    Study date  11/08/21 File: PRA002242.out


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      ----------------------------------------------------------------------

      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6406

      ----------------------------------------------------------------------
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ----------------------------------------------------------------------
      TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
      PRELIMINARY HYDROLOGY STUDY – AREA 'A'
      PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR  HOUR STORM
      HUNSAKER & ASSOCIATES, BRIAN LOWELL, PE
      ----------------------------------------------------------------------
      Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153
Sq. Mi.
      Length along longest watercourse =    5833.00(Ft.)
      Length along longest watercourse measured to centroid =    2440.00(Ft.)
      Length along longest watercourse =      1.105 Mi.
      Length along longest watercourse measured to centroid =      0.462 Mi.
      Difference in elevation =     302.00(Ft.)
      Slope along watercourse =    273.3688 Ft./Mi.
      Average Manning's 'N' = 0.015
      Lag time =    0.096 Hr.
      Lag time =     5.76 Min.
      25% of lag time =     1.44 Min.
      40% of lag time =     2.30 Min.
      Unit time =    15.00 Min.
      Duration of storm = 24 Hour(s)
      User Entered Base Flow =     0.00(CFS)

      2 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
             97.86          2.00               195.72

      100 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
             97.86          5.00               489.30

      STORM EVENT (YEAR) =    2.00
      Area Averaged 2-Year Rainfall =    2.000(In)
      Area Averaged 100-Year Rainfall =    5.000(In)
```

```
      Point rain (area averaged) =    2.000(In)
      Areal adjustment factor =   99.98 %
      Adjusted average point rain =    2.000(In)

      Sub-Area Data:
      Area(Ac.)         Runoff Index   Impervious %
          97.860           70.50         0.442
       Total Area Entered =     97.86(Ac.)


      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      70.5  51.6      0.556     0.442        0.335       1.000      0.335
                                                        Sum (F) =   0.335
      Area averaged mean soil loss (F) (In/Hr) =  0.335
      Minimum soil loss rate ((In/Hr)) =  0.167
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.546
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                        VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.250        260.360         52.212            51.493
          2   0.500        520.720         39.421            38.879
          3   0.750        781.080          6.693             6.601
          4   1.000       1041.441          1.674             1.651
                                  Sum = 100.000   Sum=      98.625
------------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.016	(0.591)	0.009	0.007
2	0.50	0.30	0.024	(0.584)	0.013	0.011
3	0.75	0.30	0.024	(0.577)	0.013	0.011
4	1.00	0.40	0.032	(0.570)	0.017	0.015
5	1.25	0.30	0.024	(0.564)	0.013	0.011
6	1.50	0.30	0.024	(0.557)	0.013	0.011
7	1.75	0.30	0.024	(0.550)	0.013	0.011
8	2.00	0.40	0.032	(0.544)	0.017	0.015
9	2.25	0.40	0.032	(0.537)	0.017	0.015
10	2.50	0.40	0.032	(0.531)	0.017	0.015
11	2.75	0.50	0.040	(0.524)	0.022	0.018
12	3.00	0.50	0.040	(0.518)	0.022	0.018
13	3.25	0.50	0.040	(0.511)	0.022	0.018
14	3.50	0.50	0.040	(0.505)	0.022	0.018
15	3.75	0.50	0.040	(0.499)	0.022	0.018
16	4.00	0.60	0.048	(0.492)	0.026	0.022
17	4.25	0.60	0.048	(0.486)	0.026	0.022
18	4.50	0.70	0.056	(0.480)	0.031	0.025
19	4.75	0.70	0.056	(0.474)	0.031	0.025
20	5.00	0.80	0.064	(0.468)	0.035	0.029
21	5.25	0.60	0.048	(0.462)	0.026	0.022
22	5.50	0.70	0.056	(0.456)	0.031	0.025
23	5.75	0.80	0.064	(0.450)	0.035	0.029
24	6.00	0.80	0.064	(0.444)	0.035	0.029

25	6.25	0.90	0.072	(0.438)	0.039	0.033
26	6.50	0.90	0.072	(0.432)	0.039	0.033
27	6.75	1.00	0.080	(0.426)	0.044	0.036
28	7.00	1.00	0.080	(0.420)	0.044	0.036
29	7.25	1.00	0.080	(0.415)	0.044	0.036
30	7.50	1.10	0.088	(0.409)	0.048	0.040
31	7.75	1.20	0.096	(0.403)	0.052	0.044
32	8.00	1.30	0.104	(0.398)	0.057	0.047
33	8.25	1.50	0.120	(0.392)	0.066	0.054
34	8.50	1.50	0.120	(0.387)	0.066	0.054
35	8.75	1.60	0.128	(0.381)	0.070	0.058
36	9.00	1.70	0.136	(0.376)	0.074	0.062
37	9.25	1.90	0.152	(0.371)	0.083	0.069
38	9.50	2.00	0.160	(0.365)	0.087	0.073
39	9.75	2.10	0.168	(0.360)	0.092	0.076
40	10.00	2.20	0.176	(0.355)	0.096	0.080
41	10.25	1.50	0.120	(0.350)	0.066	0.054
42	10.50	1.50	0.120	(0.345)	0.066	0.054
43	10.75	2.00	0.160	(0.340)	0.087	0.073
44	11.00	2.00	0.160	(0.335)	0.087	0.073
45	11.25	1.90	0.152	(0.330)	0.083	0.069
46	11.50	1.90	0.152	(0.325)	0.083	0.069
47	11.75	1.70	0.136	(0.320)	0.074	0.062
48	12.00	1.80	0.144	(0.315)	0.079	0.065
49	12.25	2.50	0.200	(0.311)	0.109	0.091
50	12.50	2.60	0.208	(0.306)	0.114	0.094
51	12.75	2.80	0.224	(0.302)	0.122	0.102
52	13.00	2.90	0.232	(0.297)	0.127	0.105
53	13.25	3.40	0.272	(0.292)	0.149	0.123
54	13.50	3.40	0.272	(0.288)	0.149	0.123
55	13.75	2.30	0.184	(0.284)	0.101	0.083
56	14.00	2.30	0.184	(0.279)	0.101	0.083
57	14.25	2.70	0.216	(0.275)	0.118	0.098
58	14.50	2.60	0.208	(0.271)	0.114	0.094
59	14.75	2.60	0.208	(0.267)	0.114	0.094
60	15.00	2.50	0.200	(0.263)	0.109	0.091
61	15.25	2.40	0.192	(0.259)	0.105	0.087
62	15.50	2.30	0.184	(0.255)	0.101	0.083
63	15.75	1.90	0.152	(0.251)	0.083	0.069
64	16.00	1.90	0.152	(0.247)	0.083	0.069
65	16.25	0.40	0.032	(0.243)	0.017	0.015
66	16.50	0.40	0.032	(0.239)	0.017	0.015
67	16.75	0.30	0.024	(0.236)	0.013	0.011
68	17.00	0.30	0.024	(0.232)	0.013	0.011
69	17.25	0.50	0.040	(0.229)	0.022	0.018
70	17.50	0.50	0.040	(0.225)	0.022	0.018
71	17.75	0.50	0.040	(0.222)	0.022	0.018
72	18.00	0.40	0.032	(0.219)	0.017	0.015
73	18.25	0.40	0.032	(0.215)	0.017	0.015
74	18.50	0.40	0.032	(0.212)	0.017	0.015
75	18.75	0.30	0.024	(0.209)	0.013	0.011
76	19.00	0.20	0.016	(0.206)	0.009	0.007
77	19.25	0.30	0.024	(0.203)	0.013	0.011
78	19.50	0.40	0.032	(0.201)	0.017	0.015
79	19.75	0.30	0.024	(0.198)	0.013	0.011
80	20.00	0.20	0.016	(0.195)	0.009	0.007
81	20.25	0.30	0.024	(0.193)	0.013	0.011
82	20.50	0.30	0.024	(0.190)	0.013	0.011
83	20.75	0.30	0.024	(0.188)	0.013	0.011
84	21.00	0.20	0.016	(0.185)	0.009	0.007
85	21.25	0.30	0.024	(0.183)	0.013	0.011
86	21.50	0.20	0.016	(0.181)	0.009	0.007
87	21.75	0.30	0.024	(0.179)	0.013	0.011
88	22.00	0.20	0.016	(0.177)	0.009	0.007
89	22.25	0.30	0.024	(0.175)	0.013	0.011

```
90  22.50     0.20      0.016       (  0.174)       0.009        0.007
91  22.75     0.20      0.016       (  0.172)       0.009        0.007
92  23.00     0.20      0.016       (  0.171)       0.009        0.007
93  23.25     0.20      0.016       (  0.170)       0.009        0.007
94  23.50     0.20      0.016       (  0.169)       0.009        0.007
95  23.75     0.20      0.016       (  0.168)       0.009        0.007
96  24.00     0.20      0.016       (  0.167)       0.009        0.007
          (Loss Rate Not Used)
   Sum =     100.0                                   Sum =     3.6
    Flood volume = Effective rainfall      0.91(In)
     times area      97.9(Ac.)/[(In)/(Ft.)] =       7.4(Ac.Ft)
    Total soil loss =      1.09(In)
    Total soil loss =     8.909(Ac.Ft)
    Total rainfall =      2.00(In)
    Flood volume =      322261.5 Cubic Feet
    Total soil loss =      388066.3 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =     12.019(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-------------------------------------------------------------------------
  0+15       0.0077      0.37  Q         |          |          |          |
  0+30       0.0251      0.84  VQ        |          |          |          |
  0+45       0.0465      1.03  V Q       |          |          |          |
  1+ 0       0.0724      1.26  V Q       |          |          |          |
  1+15       0.0975      1.22  V Q       |          |          |          |
  1+30       0.1202      1.10  V Q       |          |          |          |
  1+45       0.1425      1.08  V Q       |          |          |          |
  2+ 0       0.1686      1.26  V Q       |          |          |          |
  2+15       0.1976      1.40   VQ       |          |          |          |
  2+30       0.2270      1.43  |VQ       |          |          |          |
  2+45       0.2605      1.62  |V Q      |          |          |          |
  3+ 0       0.2969      1.76  |V Q      |          |          |          |
  3+15       0.3337      1.78  |V Q      |          |          |          |
  3+30       0.3707      1.79  | VQ      |          |          |          |
  3+45       0.4077      1.79  | VQ      |          |          |          |
  4+ 0       0.4486      1.98  | VQ      |          |          |          |
  4+15       0.4923      2.12  | V Q     |          |          |          |
  4+30       0.5404      2.33  | V Q     |          |          |          |
  4+45       0.5916      2.48  |  VQ     |          |          |          |
  5+ 0       0.6471      2.69  |  V Q    |          |          |          |
  5+15       0.6980      2.46  |  VQ     |          |          |          |
  5+30       0.7473      2.39  |   Q     |          |          |          |
  5+45       0.8026      2.68  |   VQ    |          |          |          |
  6+ 0       0.8611      2.83  |   VQ    |          |          |          |
  6+15       0.9240      3.05  |   V Q   |          |          |          |
  6+30       0.9900      3.19  |    VQ   |          |          |          |
  6+45       1.0603      3.40  |    VQ   |          |          |          |
  7+ 0       1.1336      3.55  |     VQ  |          |          |          |
  7+15       1.2075      3.57  |     VQ  |          |          |          |
  7+30       1.2853      3.77  |     VQ  |          |          |          |
  7+45       1.3700      4.10  |      VQ |          |          |          |
  8+ 0       1.4619      4.45  |      VQ |          |          |          |
  8+15       1.5650      4.99  |       VQ|          |          |          |
  8+30       1.6746      5.31  |        VQ          |          |          |
  8+45       1.7892      5.55  |        V|Q         |          |          |
  9+ 0       1.9108      5.89  |         VQ         |          |          |
  9+15       2.0436      6.43  |          VQ        |          |          |
```

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   9+30       2.1866      6.92  |          |V Q       |          |          |
   9+45       2.3376      7.31  |          | V Q      |          |          |
  10+ 0       2.4961      7.67  |          |  V Q     |          |          |
  10+15       2.6311      6.53  |          |  QV      |          |          |
  10+30       2.7462      5.57  |          |Q  V      |          |          |
  10+45       2.8774      6.35  |          | Q  V     |          |          |
  11+ 0       3.0223      7.01  |          |   Q V    |          |          |
  11+15       3.1657      6.94  |          |  Q   V   |          |          |
  11+30       3.3069      6.83  |          |  Q   V   |          |          |
  11+45       3.4399      6.44  |          | Q     V  |          |          |
  12+ 0       3.5708      6.33  |          | Q      V|          |          |
  12+15       3.7306      7.74  |          |    Q    V          |          |
  12+30       3.9149      8.92  |          |      Q   V         |          |
  12+45       4.1135      9.61  |          |        Q| V        |          |
  13+ 0       4.3232     10.15  |          |         Q  V       |          |
  13+15       4.5562     11.28  |          |          | Q V     |          |
  13+30       4.8045     12.02  |          |          |   QV    |          |
  13+45       5.0129     10.09  |          |         Q      V   |          |
  14+ 0       5.1899      8.57  |          |       Q  |       V |          |
  14+15       5.3769      9.05  |          |        Q |        V|          |
  14+30       5.5703      9.36  |          |        Q |         V          |
  14+45       5.7627      9.32  |          |        Q |          V         |
  15+ 0       5.9513      9.13  |          |        Q |          | V       |
  15+15       6.1331      8.79  |          |       Q  |          |  V      |
  15+30       6.3075      8.44  |          |     Q    |          |   V     |
  15+45       6.4629      7.52  |          |    Q     |          |   V     |
  16+ 0       6.6061      6.93  |          |  Q       |          |    V    |
  16+15       6.6892      4.02  |        Q |          |          |     V   |
  16+30       6.7281      1.88  |  Q       |          |          |     V   |
  16+45       6.7557      1.34  | Q        |          |          |     V   |
  17+ 0       6.7785      1.10  | Q        |          |          |     V   |
  17+15       6.8085      1.45  | Q        |          |          |     V   |
  17+30       6.8443      1.73  |  Q       |          |          |      V  |
  17+45       6.8810      1.78  |  Q       |          |          |      V  |
  18+ 0       6.9142      1.60  |  Q       |          |          |      V  |
  18+15       6.9444      1.46  | Q        |          |          |      V  |
  18+30       6.9741      1.44  | Q        |          |          |      V  |
  18+45       6.9998      1.25  | Q        |          |          |      V  |
  19+ 0       7.0188      0.92  |Q         |          |          |      V  |
  19+15       7.0382      0.94  |Q         |          |          |       V |
  19+30       7.0637      1.24  | Q        |          |          |       V |
  19+45       7.0887      1.21  | Q        |          |          |       V |
  20+ 0       7.1076      0.91  |Q         |          |          |       V |
  20+15       7.1270      0.94  |Q         |          |          |       V |
  20+30       7.1487      1.05  | Q        |          |          |       V |
  20+45       7.1707      1.07  | Q        |          |          |       V |
  21+ 0       7.1891      0.89  |Q         |          |          |       V |
  21+15       7.2083      0.93  |Q         |          |          |       V |
  21+30       7.2262      0.86  |Q         |          |          |        V|
  21+45       7.2453      0.93  |Q         |          |          |        V|
  22+ 0       7.2632      0.86  |Q         |          |          |        V|
  22+15       7.2823      0.93  |Q         |          |          |        V|
  22+30       7.3002      0.86  |Q         |          |          |        V|
  22+45       7.3154      0.74  |Q         |          |          |        V|
  23+ 0       7.3304      0.72  |Q         |          |          |        V|
  23+15       7.3452      0.72  |Q         |          |          |        V|
  23+30       7.3600      0.72  |Q         |          |          |        V|
  23+45       7.3748      0.72  |Q         |          |          |        V|
  24+ 0       7.3895      0.72  |Q         |          |          |        V|
  24+15       7.3966      0.34  Q          |          |          |        V|
  24+30       7.3979      0.06  Q          |          |          |        V|
  24+45       7.3981      0.01  Q          |          |          |        V|
-------------------------------------------------------------------------
```

- Area 'A' – 10 Year - Post-Development Condition – Unit Hydrograph

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: pra010110.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6407

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           0.55                 53.82

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           1.30                127.22

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    0.550(In)
Area Averaged 100-Year Rainfall =    1.300(In)

Point rain (area averaged) =    0.859(In)
Areal adjustment factor =   99.91 %
Adjusted average point rain =    0.858(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50         0.442
 Total Area Entered =     97.86(Ac.)
```

```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      70.5  70.5      0.356     0.442        0.214       1.000      0.214
                                                       Sum (F) =   0.214
      Area averaged mean soil loss (F) (In/Hr) =  0.214
      Minimum soil loss rate ((In/Hr)) =  0.107
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.546
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5200
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083         86.787         15.235             15.025
          2   0.167        173.573         46.393             45.755
          3   0.250        260.360         18.144             17.894
          4   0.333        347.147          7.825              7.718
          5   0.417        433.934          4.607              4.543
          6   0.500        520.720          2.894              2.854
          7   0.583        607.507          2.036              2.008
          8   0.667        694.294          1.334              1.316
          9   0.750        781.080          0.909              0.897
         10   0.833        867.867          0.623              0.615
                                  Sum = 100.000   Sum=      98.625
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     4.10      0.422          0.214    (  0.231)        0.208
   2   0.17     4.60      0.474          0.214    (  0.259)        0.259
   3   0.25     4.50      0.463          0.214    (  0.253)        0.249
   4   0.33     4.90      0.504          0.214    (  0.276)        0.290
   5   0.42     5.50      0.566          0.214    (  0.309)        0.352
   6   0.50     6.40      0.659          0.214    (  0.360)        0.444
   7   0.58     7.10      0.731          0.214    (  0.399)        0.516
   8   0.67     9.00      0.926          0.214    (  0.506)        0.712
   9   0.75    12.90      1.328          0.214    (  0.725)        1.113
  10   0.83    29.50      3.037          0.214    (  1.659)        2.822
  11   0.92     7.00      0.721          0.214    (  0.394)        0.506
  12   1.00     4.50      0.463          0.214    (  0.253)        0.249
               (Loss Rate Not Used)
     Sum =     100.0                                 Sum =     7.7
       Flood volume = Effective rainfall      0.64(In)
        times area      97.9(Ac.)/[(In)/(Ft.)] =       5.2(Ac.Ft)
       Total soil loss =      0.21(In)
       Total soil loss =     1.749(Ac.Ft)
       Total rainfall =      0.86(In)
       Flood volume =      228550.2 Cubic Feet
       Total soil loss =       76165.7 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =    167.324(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
  ----------------------------------------------------------------------------
    0+ 5       0.0215      3.12  Q         |         |         |         |
```

```
   0+10       0.1138     13.40  V Q       |          |          |          |
   0+15       0.2468     19.32  |V Q      |          |          |          |
   0+20       0.3983     21.99  |  VQ     |          |          |          |
   0+25       0.5771     25.96  |   VQ    |          |          |          |
   0+30       0.7952     31.67  |     Q   |          |          |          |
   0+35       1.0633     38.93  |      QV |          |          |          |
   0+40       1.3927     47.84  |        QV          |          |          |
   0+45       1.8436     65.46  |          |  QV     |          |          |
   0+50       2.6317    114.43  |          |         V Q        |          |
   0+55       3.7840    167.32  |          |          |       V |  Q       |
   1+ 0       4.4212     92.51  |          |       Q  |         |  V       |
   1+ 5       4.7756     51.45  |         Q          |         |     V    |
   1+10       4.9622     27.10  |    Q     |         |         |      V   |
   1+15       5.0737     16.19  |  Q       |         |         |       V  |
   1+20       5.1471     10.67  | Q        |         |         |        V |
   1+25       5.1945      6.88  |Q         |         |         |        V |
   1+30       5.2247      4.38  Q          |         |         |        V |
   1+35       5.2421      2.52  Q          |         |         |        V |
   1+40       5.2457      0.53  Q          |         |         |        V |
   1+45       5.2468      0.15  Q          |         |         |         V
-------------------------------------------------------------------------
```

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        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: pra010310.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6407

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =     5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           0.85                 83.18

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           2.00                195.72

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    2.000(In)

Point rain (area averaged) =    1.323(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    1.323(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50         0.442
 Total Area Entered =     97.86(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
70.5	70.5	0.356	0.442	0.214	1.000	0.214
					Sum (F) =	0.214

Area averaged mean soil loss (F) (In/Hr) = 0.214
Minimum soil loss rate ((In/Hr)) = 0.107
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	86.787	15.235	15.025
2	0.167	173.573	46.393	45.755
3	0.250	260.360	18.144	17.894
4	0.333	347.147	7.825	7.718
5	0.417	433.934	4.607	4.543
6	0.500	520.720	2.894	2.854
7	0.583	607.507	2.036	2.008
8	0.667	694.294	1.334	1.316
9	0.750	781.080	0.909	0.897
10	0.833	867.867	0.623	0.615
		Sum = 100.000	Sum=	98.625

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.206	(0.214)		0.113	0.094
2	0.17	1.30	0.206	(0.214)		0.113	0.094
3	0.25	1.10	0.175	(0.214)		0.095	0.079
4	0.33	1.50	0.238	(0.214)		0.130	0.108
5	0.42	1.50	0.238	(0.214)		0.130	0.108
6	0.50	1.80	0.286	(0.214)		0.156	0.130
7	0.58	1.50	0.238	(0.214)		0.130	0.108
8	0.67	1.80	0.286	(0.214)		0.156	0.130
9	0.75	1.80	0.286	(0.214)		0.156	0.130
10	0.83	1.50	0.238	(0.214)		0.130	0.108
11	0.92	1.60	0.254	(0.214)		0.139	0.115
12	1.00	1.80	0.286	(0.214)		0.156	0.130
13	1.08	2.20	0.349	(0.214)		0.191	0.158
14	1.17	2.20	0.349	(0.214)		0.191	0.158
15	1.25	2.20	0.349	(0.214)		0.191	0.158
16	1.33	2.00	0.317	(0.214)		0.173	0.144
17	1.42	2.60	0.413	0.214	(	0.225)	0.198
18	1.50	2.70	0.429	0.214	(	0.234)	0.214
19	1.58	2.40	0.381	(0.214)		0.208	0.173
20	1.67	2.70	0.429	0.214	(	0.234)	0.214
21	1.75	3.30	0.524	0.214	(	0.286)	0.309
22	1.83	3.10	0.492	0.214	(	0.269)	0.278
23	1.92	2.90	0.460	0.214	(	0.251)	0.246
24	2.00	3.00	0.476	0.214	(	0.260)	0.262
25	2.08	3.10	0.492	0.214	(	0.269)	0.278
26	2.17	4.20	0.667	0.214	(	0.364)	0.452
27	2.25	5.00	0.794	0.214	(	0.434)	0.579
28	2.33	3.50	0.555	0.214	(	0.303)	0.341
29	2.42	6.80	1.079	0.214	(	0.590)	0.865
30	2.50	7.30	1.159	0.214	(	0.633)	0.944
31	2.58	8.20	1.301	0.214	(	0.711)	1.087
32	2.67	5.90	0.936	0.214	(	0.512)	0.722
33	2.75	2.00	0.317	(0.214)		0.173	0.144
34	2.83	1.80	0.286	(0.214)		0.156	0.130
35	2.92	1.80	0.286	(0.214)		0.156	0.130

```
 36   3.00     0.60      0.095       (  0.214)       0.052        0.043
              (Loss Rate Not Used)
    Sum =     100.0                                  Sum =     9.6
       Flood volume = Effective rainfall      0.80(In)
        times area      97.9(Ac.)/[(In)/(Ft.)] =       6.5(Ac.Ft)
       Total soil loss =      0.53(In)
       Total soil loss =     4.289(Ac.Ft)
       Total rainfall =      1.32(In)
       Flood volume =      282975.1 Cubic Feet
       Total soil loss =      186837.7 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =     89.058(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       22.5      45.0      67.5      90.0
 ----------------------------------------------------------------------------
   0+ 5       0.0097      1.41  Q         |         |         |         |
   0+10       0.0489      5.69  V Q       |         |         |         |
   0+15       0.0981      7.15  V  Q      |         |         |         |
   0+20       0.1508      7.65  V  Q      |         |         |         |
   0+25       0.2137      9.13  |V  Q     |         |         |         |
   0+30       0.2835     10.13  |V  Q     |         |         |         |
   0+35       0.3602     11.14  | V Q     |         |         |         |
   0+40       0.4365     11.08  | V Q     |         |         |         |
   0+45       0.5190     11.98  |  V Q    |         |         |         |
   0+50       0.6021     12.07  |  V Q    |         |         |         |
   0+55       0.6803     11.35  |   VQ    |         |         |         |
   1+ 0       0.7602     11.60  |   VQ    |         |         |         |
   1+ 5       0.8478     12.72  |    Q    |         |         |         |
   1+10       0.9462     14.29  |    VQ   |         |         |         |
   1+15       1.0489     14.91  |     Q   |         |         |         |
   1+20       1.1519     14.96  |     QV  |         |         |         |
   1+25       1.2573     15.29  |     QV  |         |         |         |
   1+30       1.3802     17.86  |      QV |         |         |         |
   1+35       1.5103     18.89  |       QV|         |         |         |
   1+40       1.6365     18.31  |       Q V         |         |         |
   1+45       1.7829     21.26  |         QV        |         |         |
   1+50       1.9604     25.78  |          |QV       |         |         |
   1+55       2.1382     25.82  |          |Q V      |         |         |
   2+ 0       2.3099     24.93  |          |Q  V     |         |         |
   2+ 5       2.4863     25.61  |          |Q   V    |         |         |
   2+10       2.6874     29.20  |          | Q   V   |         |         |
   2+15       2.9594     39.50  |          |      QV |         |         |
   2+20       3.2696     45.03  |          |         Q         |         |
   2+25       3.5847     45.75  |          |         Q V       |         |
   2+30       4.0564     68.50  |          |           |   V     Q         |
   2+35       4.6273     82.90  |          |           |       V |     Q   |
   2+40       5.2406     89.06  |          |           |         | V       Q|
   2+45       5.7161     69.04  |          |           |         Q    V    |
   2+50       5.9823     38.64  |          |      Q    |          |     V   |
   2+55       6.1658     26.66  |          |Q          |          |      V  |
   3+ 0       6.3043     20.10  |        Q  |           |          |       V |
   3+ 5       6.3898     12.43  |     Q     |           |          |        V|
   3+10       6.4383      7.04  |   Q       |           |          |        V|
   3+15       6.4665      4.09  |Q          |           |          |        V|
   3+20       6.4825      2.33  |Q          |           |          |        V|
   3+25       6.4903      1.13  Q           |           |          |        V|
   3+30       6.4935      0.46  Q           |           |          |        V|
   3+35       6.4952      0.25  Q           |           |          |        V|
   3+40       6.4960      0.12  Q           |           |          |        V|
   3+45       6.4962      0.03  Q           |           |          |         V
----------------------------------------------------------------------------
```

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: pra010610.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6407

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =     5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           1.20                117.43

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           3.00                293.58

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =    1.200(In)
Area Averaged 100-Year Rainfall =    3.000(In)

Point rain (area averaged) =    1.941(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    1.940(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50         0.442
 Total Area Entered =     97.86(Ac.)
```

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
70.5	70.5	0.356	0.442	0.214	1.000	0.214
					Sum (F) =	0.214

Area averaged mean soil loss (F) (In/Hr) = 0.214
Minimum soil loss rate ((In/Hr)) = 0.107
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period	(hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	86.787	15.235	15.025
2	0.167	173.573	46.393	45.755
3	0.250	260.360	18.144	17.894
4	0.333	347.147	7.825	7.718
5	0.417	433.934	4.607	4.543
6	0.500	520.720	2.894	2.854
7	0.583	607.507	2.036	2.008
8	0.667	694.294	1.334	1.316
9	0.750	781.080	0.909	0.897
10	0.833	867.867	0.623	0.615
			Sum = 100.000	Sum= 98.625

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.116	(0.214)	0.064	0.053
2	0.17	0.60	0.140	(0.214)	0.076	0.063
3	0.25	0.60	0.140	(0.214)	0.076	0.063
4	0.33	0.60	0.140	(0.214)	0.076	0.063
5	0.42	0.60	0.140	(0.214)	0.076	0.063
6	0.50	0.70	0.163	(0.214)	0.089	0.074
7	0.58	0.70	0.163	(0.214)	0.089	0.074
8	0.67	0.70	0.163	(0.214)	0.089	0.074
9	0.75	0.70	0.163	(0.214)	0.089	0.074
10	0.83	0.70	0.163	(0.214)	0.089	0.074
11	0.92	0.70	0.163	(0.214)	0.089	0.074
12	1.00	0.80	0.186	(0.214)	0.102	0.084
13	1.08	0.80	0.186	(0.214)	0.102	0.084
14	1.17	0.80	0.186	(0.214)	0.102	0.084
15	1.25	0.80	0.186	(0.214)	0.102	0.084
16	1.33	0.80	0.186	(0.214)	0.102	0.084
17	1.42	0.80	0.186	(0.214)	0.102	0.084
18	1.50	0.80	0.186	(0.214)	0.102	0.084
19	1.58	0.80	0.186	(0.214)	0.102	0.084
20	1.67	0.80	0.186	(0.214)	0.102	0.084
21	1.75	0.80	0.186	(0.214)	0.102	0.084
22	1.83	0.80	0.186	(0.214)	0.102	0.084
23	1.92	0.80	0.186	(0.214)	0.102	0.084
24	2.00	0.90	0.210	(0.214)	0.114	0.095
25	2.08	0.80	0.186	(0.214)	0.102	0.084
26	2.17	0.90	0.210	(0.214)	0.114	0.095
27	2.25	0.90	0.210	(0.214)	0.114	0.095
28	2.33	0.90	0.210	(0.214)	0.114	0.095
29	2.42	0.90	0.210	(0.214)	0.114	0.095
30	2.50	0.90	0.210	(0.214)	0.114	0.095
31	2.58	0.90	0.210	(0.214)	0.114	0.095
32	2.67	0.90	0.210	(0.214)	0.114	0.095
33	2.75	1.00	0.233	(0.214)	0.127	0.106
34	2.83	1.00	0.233	(0.214)	0.127	0.106
35	2.92	1.00	0.233	(0.214)	0.127	0.106
36	3.00	1.00	0.233	(0.214)	0.127	0.106

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37   3.08     1.00      0.233       (  0.214)       0.127        0.106
38   3.17     1.10      0.256       (  0.214)       0.140        0.116
39   3.25     1.10      0.256       (  0.214)       0.140        0.116
40   3.33     1.10      0.256       (  0.214)       0.140        0.116
41   3.42     1.20      0.279       (  0.214)       0.153        0.127
42   3.50     1.30      0.303       (  0.214)       0.165        0.137
43   3.58     1.40      0.326       (  0.214)       0.178        0.148
44   3.67     1.40      0.326       (  0.214)       0.178        0.148
45   3.75     1.50      0.349       (  0.214)       0.191        0.158
46   3.83     1.50      0.349       (  0.214)       0.191        0.158
47   3.92     1.60      0.372       (  0.214)       0.203        0.169
48   4.00     1.60      0.372       (  0.214)       0.203        0.169
49   4.08     1.70      0.396          0.214    (  0.216)       0.181
50   4.17     1.80      0.419          0.214    (  0.229)       0.205
51   4.25     1.90      0.442          0.214    (  0.242)       0.228
52   4.33     2.00      0.466          0.214    (  0.254)       0.251
53   4.42     2.10      0.489          0.214    (  0.267)       0.274
54   4.50     2.10      0.489          0.214    (  0.267)       0.274
55   4.58     2.20      0.512          0.214    (  0.280)       0.298
56   4.67     2.30      0.535          0.214    (  0.293)       0.321
57   4.75     2.40      0.559          0.214    (  0.305)       0.344
58   4.83     2.40      0.559          0.214    (  0.305)       0.344
59   4.92     2.50      0.582          0.214    (  0.318)       0.368
60   5.00     2.60      0.605          0.214    (  0.331)       0.391
61   5.08     3.10      0.722          0.214    (  0.394)       0.507
62   5.17     3.60      0.838          0.214    (  0.458)       0.624
63   5.25     3.90      0.908          0.214    (  0.496)       0.693
64   5.33     4.20      0.978          0.214    (  0.534)       0.763
65   5.42     4.70      1.094          0.214    (  0.598)       0.880
66   5.50     5.60      1.304          0.214    (  0.712)       1.089
67   5.58     1.90      0.442          0.214    (  0.242)       0.228
68   5.67     0.90      0.210       (  0.214)       0.114        0.095
69   5.75     0.60      0.140       (  0.214)       0.076        0.063
70   5.83     0.50      0.116       (  0.214)       0.064        0.053
71   5.92     0.30      0.070       (  0.214)       0.038        0.032
72   6.00     0.20      0.047       (  0.214)       0.025        0.021
            (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    13.2
      Flood volume = Effective rainfall      1.10(In)
       times area      97.9(Ac.)/[(In)/(Ft.)] =       9.0(Ac.Ft)
      Total soil loss =      0.84(In)
      Total soil loss =     6.831(Ac.Ft)
      Total rainfall =      1.94(In)
      Flood volume =      391569.5 Cubic Feet
      Total soil loss =      297538.2 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     81.938(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       22.5      45.0      67.5      90.0
-------------------------------------------------------------------------
  0+ 5       0.0055      0.79  Q         |         |         |         |
  0+10       0.0287      3.37  VQ        |         |         |         |
  0+15       0.0617      4.80  V Q       |         |         |         |
  0+20       0.0989      5.40  V Q       |         |         |         |
  0+25       0.1383      5.72  V Q       |         |         |         |
  0+30       0.1801      6.07  V Q       |         |         |         |
  0+35       0.2262      6.69  |VQ       |         |         |         |
  0+40       0.2742      6.97  |V Q      |         |         |         |
  0+45       0.3232      7.12  |V Q      |         |         |         |
  0+50       0.3729      7.21  |V Q      |         |         |         |
  0+55       0.4228      7.24  |V Q      |         |         |         |
  1+ 0       0.4739      7.42  | VQ      |         |         |         |
  1+ 5       0.5285      7.92  | VQ      |         |         |         |
  1+10       0.5844      8.12  | VQ      |         |         |         |
  1+15       0.6409      8.21  | VQ      |         |         |         |
  1+20       0.6978      8.26  |  Q      |         |         |         |
```

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   1+25       0.7548      8.29  |  Q      |         |         |         |
   1+30       0.8120      8.31  |  Q      |         |         |         |
   1+35       0.8693      8.32  |  Q      |         |         |         |
   1+40       0.9267      8.33  |  QV     |         |         |         |
   1+45       0.9841      8.34  |  QV     |         |         |         |
   1+50       1.0415      8.34  |  QV     |         |         |         |
   1+55       1.0990      8.34  |  QV     |         |         |         |
   2+ 0       1.1575      8.50  |  Q V    |         |         |         |
   2+ 5       1.2182      8.82  |  Q V    |         |         |         |
   2+10       1.2780      8.68  |  Q V    |         |         |         |
   2+15       1.3404      9.06  |   QV    |         |         |         |
   2+20       1.4039      9.22  |   Q V   |         |         |         |
   2+25       1.4678      9.28  |   Q V   |         |         |         |
   2+30       1.5320      9.32  |   Q V   |         |         |         |
   2+35       1.5963      9.34  |   Q  V  |         |         |         |
   2+40       1.6608      9.36  |   Q  V  |         |         |         |
   2+45       1.7264      9.53  |   Q  V  |         |         |         |
   2+50       1.7954     10.01  |   Q  V  |         |         |         |
   2+55       1.8657     10.21  |   Q   V |         |         |         |
   3+ 0       1.9366     10.29  |   Q   V |         |         |         |
   3+ 5       2.0078     10.34  |   Q   V |         |         |         |
   3+10       2.0803     10.53  |   Q    V|         |         |         |
   3+15       2.1563     11.03  |   Q    V|         |         |         |
   3+20       2.2337     11.24  |   Q    V|         |         |         |
   3+25       2.3128     11.49  |    Q    V         |         |         |
   3+30       2.3967     12.18  |    Q    V         |         |         |
   3+35       2.4865     13.04  |    Q    |V        |         |         |
   3+40       2.5817     13.82  |     Q   |V        |         |         |
   3+45       2.6803     14.31  |     Q   |V        |         |         |
   3+50       2.7833     14.96  |     Q   | V       |         |         |
   3+55       2.8895     15.42  |     Q   | V       |         |         |
   4+ 0       3.0000     16.05  |      Q  |  V      |         |         |
   4+ 5       3.1138     16.52  |      Q  |  V      |         |         |
   4+10       3.2348     17.57  |      Q  |   V     |         |         |
   4+15       3.3677     19.29  |       Q |   V     |         |         |
   4+20       3.5142     21.27  |         Q|    V    |         |         |
   4+25       3.6751     23.37  |          Q     V  |         |         |
   4+30       3.8486     25.19  |          |Q     V  |         |         |
   4+35       4.0301     26.35  |          |Q     V  |         |         |
   4+40       4.2242     28.18  |          | Q     V |         |         |
   4+45       4.4327     30.28  |          |  Q     V|         |         |
   4+50       4.6539     32.11  |          |   Q     V         |         |
   4+55       4.8831     33.28  |          |   Q     |V        |         |
   5+ 0       5.1249     35.11  |          |    Q    | V       |         |
   5+ 5       5.3907     38.60  |          |      Q  |  V      |         |
   5+10       5.7105     46.43  |          |         Q    V    |         |
   5+15       6.0912     55.28  |          |          |   Q  V  |         |
   5+20       6.5233     62.74  |          |          |      Q V|         |
   5+25       7.0089     70.52  |          |          |         |Q        |
   5+30       7.5719     81.74  |          |          |         |  V  Q   |
   5+35       8.1362     81.94  |          |          |         |     Q   |
   5+40       8.4537     46.10  |          |         Q         |      V  |
   5+45       8.6388     26.88  |         |Q         |         |       V |
   5+50       8.7623     17.94  |      Q  |          |         |       V |
   5+55       8.8497     12.69  |    Q    |          |         |        V|
   6+ 0       8.9099      8.74  |  Q      |          |         |        V|
   6+ 5       8.9489      5.65  | Q       |          |         |        V|
   6+10       8.9699      3.05  |Q        |          |         |        V|
   6+15       8.9808      1.58  Q         |          |         |        V|
   6+20       8.9849      0.60  Q         |          |         |        V|
   6+25       8.9871      0.31  Q         |          |         |        V|
   6+30       8.9882      0.17  Q         |          |         |        V|
   6+35       8.9888      0.09  Q         |          |         |        V|
   6+40       8.9891      0.04  Q         |          |         |        V|
   6+45       8.9892      0.01  Q         |          |         |         V
-------------------------------------------------------------------------
```

```
              U n i t   H y d r o g r a p h   A n a l y s i s

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                    Study date  11/08/21 File: PRA0102410.out


      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
      ------------------------------------------------------------------------

      Riverside County Synthetic Unit Hydrology Method
      RCFC & WCD Manual date - April 1978


      Program License Serial Number 6406

      ------------------------------------------------------------------------
       English (in-lb) Input Units Used
       English Rainfall Data (Inches) Input Values Used

       English Units used in output format



      ------------------------------------------------------------------------
      TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
      PRELIMINARY HYDROLOGY STUDY – AREA 'A'
      PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR  HOUR STORM
      HUNSAKER & ASSOCIATES, BRIAN LOWELL, PE
      ------------------------------------------------------------------------
      Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
      Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153
Sq. Mi.
      Length along longest watercourse =    5833.00(Ft.)
      Length along longest watercourse measured to centroid =    2440.00(Ft.)
      Length along longest watercourse =      1.105 Mi.
      Length along longest watercourse measured to centroid =      0.462 Mi.
      Difference in elevation =     302.00(Ft.)
      Slope along watercourse =    273.3688 Ft./Mi.
      Average Manning's 'N' = 0.015
      Lag time =    0.096 Hr.
      Lag time =     5.76 Min.
      25% of lag time =     1.44 Min.
      40% of lag time =     2.30 Min.
      Unit time =    15.00 Min.
      Duration of storm = 24 Hour(s)
      User Entered Base Flow =     0.00(CFS)

      2 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
             97.86          2.00               195.72

      100 YEAR Area rainfall data:


      Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
             97.86          5.00               489.30

      STORM EVENT (YEAR) =   10.00
      Area Averaged 2-Year Rainfall =    2.000(In)
      Area Averaged 100-Year Rainfall =    5.000(In)
```

```
      Point rain (area averaged) =    3.234(In)
      Areal adjustment factor =   99.98 %
      Adjusted average point rain =    3.234(In)

      Sub-Area Data:
      Area(Ac.)         Runoff Index   Impervious %
          97.860           70.50         0.442
       Total Area Entered =     97.86(Ac.)


      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      70.5  70.5      0.356     0.442        0.214       1.000      0.214
                                                        Sum (F) =   0.214
      Area averaged mean soil loss (F) (In/Hr) =  0.214
      Minimum soil loss rate ((In/Hr)) =  0.107
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.546
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                        VALLEY S-Curve
      ------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.250        260.360         52.212            51.493
          2   0.500        520.720         39.421            38.879
          3   0.750        781.080          6.693             6.601
          4   1.000       1041.441          1.674             1.651
                                  Sum = 100.000   Sum=      98.625
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.026	(0.379)	0.014	0.012
2	0.50	0.30	0.039	(0.374)	0.021	0.018
3	0.75	0.30	0.039	(0.370)	0.021	0.018
4	1.00	0.40	0.052	(0.366)	0.028	0.023
5	1.25	0.30	0.039	(0.361)	0.021	0.018
6	1.50	0.30	0.039	(0.357)	0.021	0.018
7	1.75	0.30	0.039	(0.353)	0.021	0.018
8	2.00	0.40	0.052	(0.348)	0.028	0.023
9	2.25	0.40	0.052	(0.344)	0.028	0.023
10	2.50	0.40	0.052	(0.340)	0.028	0.023
11	2.75	0.50	0.065	(0.336)	0.035	0.029
12	3.00	0.50	0.065	(0.332)	0.035	0.029
13	3.25	0.50	0.065	(0.328)	0.035	0.029
14	3.50	0.50	0.065	(0.324)	0.035	0.029
15	3.75	0.50	0.065	(0.319)	0.035	0.029
16	4.00	0.60	0.078	(0.315)	0.042	0.035
17	4.25	0.60	0.078	(0.311)	0.042	0.035
18	4.50	0.70	0.091	(0.308)	0.049	0.041
19	4.75	0.70	0.091	(0.304)	0.049	0.041
20	5.00	0.80	0.103	(0.300)	0.057	0.047
21	5.25	0.60	0.078	(0.296)	0.042	0.035
22	5.50	0.70	0.091	(0.292)	0.049	0.041
23	5.75	0.80	0.103	(0.288)	0.057	0.047
24	6.00	0.80	0.103	(0.284)	0.057	0.047

25	6.25	0.90	0.116	(0.281)	0.064	0.053
26	6.50	0.90	0.116	(0.277)	0.064	0.053
27	6.75	1.00	0.129	(0.273)	0.071	0.059
28	7.00	1.00	0.129	(0.269)	0.071	0.059
29	7.25	1.00	0.129	(0.266)	0.071	0.059
30	7.50	1.10	0.142	(0.262)	0.078	0.065
31	7.75	1.20	0.155	(0.258)	0.085	0.070
32	8.00	1.30	0.168	(0.255)	0.092	0.076
33	8.25	1.50	0.194	(0.251)	0.106	0.088
34	8.50	1.50	0.194	(0.248)	0.106	0.088
35	8.75	1.60	0.207	(0.244)	0.113	0.094
36	9.00	1.70	0.220	(0.241)	0.120	0.100
37	9.25	1.90	0.246	(0.238)	0.134	0.111
38	9.50	2.00	0.259	(0.234)	0.141	0.117
39	9.75	2.10	0.272	(0.231)	0.148	0.123
40	10.00	2.20	0.285	(0.228)	0.155	0.129
41	10.25	1.50	0.194	(0.224)	0.106	0.088
42	10.50	1.50	0.194	(0.221)	0.106	0.088
43	10.75	2.00	0.259	(0.218)	0.141	0.117
44	11.00	2.00	0.259	(0.215)	0.141	0.117
45	11.25	1.90	0.246	(0.211)	0.134	0.111
46	11.50	1.90	0.246	(0.208)	0.134	0.111
47	11.75	1.70	0.220	(0.205)	0.120	0.100
48	12.00	1.80	0.233	(0.202)	0.127	0.106
49	12.25	2.50	0.323	(0.199)	0.177	0.147
50	12.50	2.60	0.336	(0.196)	0.184	0.153
51	12.75	2.80	0.362	0.193	(0.198)	0.169
52	13.00	2.90	0.375	0.190	(0.205)	0.185
53	13.25	3.40	0.440	0.187	(0.240)	0.252
54	13.50	3.40	0.440	0.185	(0.240)	0.255
55	13.75	2.30	0.297	(0.182)	0.163	0.135
56	14.00	2.30	0.297	(0.179)	0.163	0.135
57	14.25	2.70	0.349	0.176	(0.191)	0.173
58	14.50	2.60	0.336	0.174	(0.184)	0.163
59	14.75	2.60	0.336	0.171	(0.184)	0.165
60	15.00	2.50	0.323	0.168	(0.177)	0.155
61	15.25	2.40	0.310	0.166	(0.170)	0.145
62	15.50	2.30	0.297	(0.163)	0.163	0.135
63	15.75	1.90	0.246	(0.161)	0.134	0.111
64	16.00	1.90	0.246	(0.158)	0.134	0.111
65	16.25	0.40	0.052	(0.156)	0.028	0.023
66	16.50	0.40	0.052	(0.153)	0.028	0.023
67	16.75	0.30	0.039	(0.151)	0.021	0.018
68	17.00	0.30	0.039	(0.149)	0.021	0.018
69	17.25	0.50	0.065	(0.147)	0.035	0.029
70	17.50	0.50	0.065	(0.144)	0.035	0.029
71	17.75	0.50	0.065	(0.142)	0.035	0.029
72	18.00	0.40	0.052	(0.140)	0.028	0.023
73	18.25	0.40	0.052	(0.138)	0.028	0.023
74	18.50	0.40	0.052	(0.136)	0.028	0.023
75	18.75	0.30	0.039	(0.134)	0.021	0.018
76	19.00	0.20	0.026	(0.132)	0.014	0.012
77	19.25	0.30	0.039	(0.130)	0.021	0.018
78	19.50	0.40	0.052	(0.129)	0.028	0.023
79	19.75	0.30	0.039	(0.127)	0.021	0.018
80	20.00	0.20	0.026	(0.125)	0.014	0.012
81	20.25	0.30	0.039	(0.123)	0.021	0.018
82	20.50	0.30	0.039	(0.122)	0.021	0.018
83	20.75	0.30	0.039	(0.120)	0.021	0.018
84	21.00	0.20	0.026	(0.119)	0.014	0.012
85	21.25	0.30	0.039	(0.117)	0.021	0.018
86	21.50	0.20	0.026	(0.116)	0.014	0.012
87	21.75	0.30	0.039	(0.115)	0.021	0.018
88	22.00	0.20	0.026	(0.114)	0.014	0.012
89	22.25	0.30	0.039	(0.112)	0.021	0.018

```
90  22.50     0.20      0.026       (  0.111)       0.014        0.012
91  22.75     0.20      0.026       (  0.110)       0.014        0.012
92  23.00     0.20      0.026       (  0.110)       0.014        0.012
93  23.25     0.20      0.026       (  0.109)       0.014        0.012
94  23.50     0.20      0.026       (  0.108)       0.014        0.012
95  23.75     0.20      0.026       (  0.108)       0.014        0.012
96  24.00     0.20      0.026       (  0.107)       0.014        0.012
          (Loss Rate Not Used)
   Sum =     100.0                                    Sum =     6.0
    Flood volume = Effective rainfall      1.51(In)
     times area      97.9(Ac.)/[(In)/(Ft.)] =      12.3(Ac.Ft)
    Total soil loss =      1.72(In)
    Total soil loss =    14.045(Ac.Ft)
    Total rainfall =      3.23(In)
    Flood volume =      536883.3 Cubic Feet
    Total soil loss =      611796.4 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =     24.463(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-------------------------------------------------------------------------
  0+15       0.0125      0.60  Q         |          |          |          |
  0+30       0.0407      1.36  VQ        |          |          |          |
  0+45       0.0752      1.67  V Q       |          |          |          |
  1+ 0       0.1171      2.03  V Q       |          |          |          |
  1+15       0.1577      1.97  V Q       |          |          |          |
  1+30       0.1944      1.78  V Q       |          |          |          |
  1+45       0.2305      1.75  V Q       |          |          |          |
  2+ 0       0.2726      2.04  V Q       |          |          |          |
  2+15       0.3195      2.27   V Q      |          |          |          |
  2+30       0.3671      2.31  |V Q      |          |          |          |
  2+45       0.4212      2.62  |V Q      |          |          |          |
  3+ 0       0.4800      2.85  |V Q      |          |          |          |
  3+15       0.5397      2.89  |V Q      |          |          |          |
  3+30       0.5995      2.90  |V Q      |          |          |          |
  3+45       0.6593      2.90  | VQ      |          |          |          |
  4+ 0       0.7254      3.20  | V Q     |          |          |          |
  4+15       0.7961      3.43  | V Q     |          |          |          |
  4+30       0.8740      3.77  | V  Q    |          |          |          |
  4+45       0.9567      4.00  |  V Q    |          |          |          |
  5+ 0       1.0465      4.35  |  V Q    |          |          |          |
  5+15       1.1287      3.98  |  V Q    |          |          |          |
  5+30       1.2085      3.86  |  V Q    |          |          |          |
  5+45       1.2979      4.33  |   VQ    |          |          |          |
  6+ 0       1.3924      4.57  |   V Q   |          |          |          |
  6+15       1.4942      4.92  |   V Q   |          |          |          |
  6+30       1.6009      5.16  |    VQ   |          |          |          |
  6+45       1.7146      5.50  |    V Q  |          |          |          |
  7+ 0       1.8332      5.74  |    V Q  |          |          |          |
  7+15       1.9527      5.78  |     VQ  |          |          |          |
  7+30       2.0785      6.09  |     V Q |          |          |          |
  7+45       2.2154      6.62  |      VQ |          |          |          |
  8+ 0       2.3640      7.19  |      V Q|          |          |          |
  8+15       2.5308      8.07  |       V Q          |          |          |
  8+30       2.7081      8.58  |       V |Q         |          |          |
  8+45       2.8934      8.97  |        V|Q         |          |          |
  9+ 0       3.0900      9.52  |         V Q        |          |          |
  9+15       3.3047     10.39  |         V  Q       |          |          |
```

```
   9+30       3.5360     11.20  |           V  Q     |          |          |
   9+45       3.7802     11.82  |          | V  Q    |          |          |
  10+ 0       4.0364     12.40  |          |  V  Q   |          |          |
  10+15       4.2547     10.56  |          |  VQ     |          |          |
  10+30       4.4410      9.02  |          | Q V     |          |          |
  10+45       4.6531     10.27  |          |  Q V    |          |          |
  11+ 0       4.8873     11.34  |          |    Q    |          |          |
  11+15       5.1194     11.23  |          |   Q V   |          |          |
  11+30       5.3477     11.05  |          |   Q  V  |          |          |
  11+45       5.5627     10.41  |          |  Q    V |          |          |
  12+ 0       5.7743     10.24  |          |  Q    V |          |          |
  12+15       6.0328     12.51  |          |     Q  V|          |          |
  12+30       6.3309     14.43  |          |        QV          |          |
  12+45       6.6570     15.78  |          |          Q         |          |
  13+ 0       7.0153     17.34  |          |          | VQ      |          |
  13+15       7.4607     21.56  |          |          |   V   Q |          |
  13+30       7.9661     24.46  |          |          |    V    | Q        |
  13+45       8.3556     18.85  |          |          |    Q V  |          |
  14+ 0       8.6512     14.31  |          |         Q|       V |          |
  14+15       8.9709     15.47  |          |          Q        V|          |
  14+30       9.3061     16.22  |          |          |Q        V          |
  14+45       9.6411     16.21  |          |          |Q         V         |
  15+ 0       9.9671     15.78  |          |          |Q        | V       |
  15+15      10.2738     14.85  |          |         Q|         |  V      |
  15+30      10.5606     13.88  |          |        Q |         |   V     |
  15+45      10.8127     12.21  |          |      Q   |         |    V    |
  16+ 0      11.0444     11.21  |          |   Q      |         |    V    |
  16+15      11.1788      6.51  |        Q |          |         |     V   |
  16+30      11.2417      3.04  |   Q      |          |         |     V   |
  16+45      11.2863      2.16  | Q        |          |         |     V   |
  17+ 0      11.3232      1.79  | Q        |          |         |     V   |
  17+15      11.3718      2.35  |  Q       |          |         |     V   |
  17+30      11.4296      2.80  |  Q       |          |         |      V  |
  17+45      11.4890      2.88  |  Q       |          |         |      V  |
  18+ 0      11.5426      2.59  |  Q       |          |         |      V  |
  18+15      11.5914      2.36  |  Q       |          |         |      V  |
  18+30      11.6395      2.33  |  Q       |          |         |      V  |
  18+45      11.6811      2.01  | Q        |          |         |      V  |
  19+ 0      11.7117      1.48  |Q         |          |         |       V |
  19+15      11.7431      1.52  | Q        |          |         |       V |
  19+30      11.7844      2.00  | Q        |          |         |       V |
  19+45      11.8248      1.96  | Q        |          |         |       V |
  20+ 0      11.8553      1.47  |Q         |          |         |       V |
  20+15      11.8867      1.52  | Q        |          |         |       V |
  20+30      11.9218      1.70  | Q        |          |         |       V |
  20+45      11.9574      1.73  | Q        |          |         |       V |
  21+ 0      11.9871      1.43  |Q         |          |         |       V |
  21+15      12.0183      1.51  | Q        |          |         |        V|
  21+30      12.0471      1.40  |Q         |          |         |        V|
  21+45      12.0781      1.50  |Q         |          |         |        V|
  22+ 0      12.1069      1.40  |Q         |          |         |        V|
  22+15      12.1379      1.50  |Q         |          |         |        V|
  22+30      12.1667      1.40  |Q         |          |         |        V|
  22+45      12.1915      1.20  |Q         |          |         |        V|
  23+ 0      12.2156      1.17  |Q         |          |         |        V|
  23+15      12.2395      1.16  |Q         |          |         |        V|
  23+30      12.2635      1.16  |Q         |          |         |        V|
  23+45      12.2874      1.16  |Q         |          |         |        V|
  24+ 0      12.3113      1.16  |Q         |          |         |        V|
  24+15      12.3227      0.55  Q          |          |         |        V|
  24+30      12.3247      0.10  Q          |          |         |        V|
  24+45      12.3251      0.02  Q          |          |         |         V
-------------------------------------------------------------------------
```

- Area 'A' – 100 Year - Post-Development Condition – Unit Hydrograph

```
        U n i t   H y d r o g r a p h   A n a l y s i s

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
               Study date  05/18/21 File: pra1001100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6407

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =     5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           0.55                 53.82

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           1.30                127.22

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.550(In)
Area Averaged 100-Year Rainfall =    1.300(In)

Point rain (area averaged) =    1.300(In)
Areal adjustment factor =   99.91 %
Adjusted average point rain =    1.299(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50         0.442
 Total Area Entered =     97.86(Ac.)
```

```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      70.5  85.3      0.184     0.442        0.111       1.000      0.111
                                                        Sum (F) =   0.111
      Area averaged mean soil loss (F) (In/Hr) =  0.111
      Minimum soil loss rate ((In/Hr)) =  0.055
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.546
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5200
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083         86.787         15.235             15.025
          2   0.167        173.573         46.393             45.755
          3   0.250        260.360         18.144             17.894
          4   0.333        347.147          7.825              7.718
          5   0.417        433.934          4.607              4.543
          6   0.500        520.720          2.894              2.854
          7   0.583        607.507          2.036              2.008
          8   0.667        694.294          1.334              1.316
          9   0.750        781.080          0.909              0.897
         10   0.833        867.867          0.623              0.615
                                  Sum = 100.000   Sum=      98.625
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low         (In/Hr)
   1   0.08     4.10      0.639          0.111    (  0.349)        0.528
   2   0.17     4.60      0.717          0.111    (  0.392)        0.606
   3   0.25     4.50      0.701          0.111    (  0.383)        0.591
   4   0.33     4.90      0.764          0.111    (  0.417)        0.653
   5   0.42     5.50      0.857          0.111    (  0.468)        0.747
   6   0.50     6.40      0.998          0.111    (  0.545)        0.887
   7   0.58     7.10      1.107          0.111    (  0.605)        0.996
   8   0.67     9.00      1.403          0.111    (  0.766)        1.292
   9   0.75    12.90      2.011          0.111    (  1.098)        1.900
  10   0.83    29.50      4.598          0.111    (  2.512)        4.487
  11   0.92     7.00      1.091          0.111    (  0.596)        0.980
  12   1.00     4.50      0.701          0.111    (  0.383)        0.591
               (Loss Rate Not Used)
     Sum =     100.0                                 Sum =    14.3
       Flood volume = Effective rainfall      1.19(In)
        times area      97.9(Ac.)/[(In)/(Ft.)] =       9.7(Ac.Ft)
       Total soil loss =      0.11(In)
       Total soil loss =     0.901(Ac.Ft)
       Total rainfall =      1.30(In)
       Flood volume =      422126.1 Cubic Feet
       Total soil loss =       39265.7 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =    274.485(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
  ----------------------------------------------------------------------------
    0+ 5       0.0547      7.94  VQ        |         |         |         |
```

```
   0+10       0.2841     33.31  |V  Q     |          |          |          |
   0+15       0.6017     46.11  | V   Q   |          |          |          |
   0+20       0.9584     51.81  |  V  Q   |          |          |          |
   0+25       1.3633     58.79  |    V Q  |          |          |          |
   0+30       1.8319     68.04  |      V Q|          |          |          |
   0+35       2.3792     79.47  |         VQ          |          |          |
   0+40       3.0214     93.24  |          | Q        |          |          |
   0+45       3.8487    120.12  |          |    VQ    |          |          |
   0+50       5.1875    194.39  |          |          |V   Q     |          |
   0+55       7.0779    274.49  |          |          |         V|     Q    |
   1+ 0       8.1881    161.21  |          |          |Q         |  V       |
   1+ 5       8.8480     95.82  |          | Q        |          |     V    |
   1+10       9.1864     49.13  |      Q   |          |          |      V   |
   1+15       9.3847     28.79  |  Q       |          |          |       V  |
   1+20       9.5140     18.77  | Q        |          |          |        V |
   1+25       9.5971     12.07  |Q         |          |          |        V |
   1+30       9.6500      7.67  |Q         |          |          |        V |
   1+35       9.6804      4.42  Q          |          |          |        V |
   1+40       9.6882      1.13  Q          |          |          |        V |
   1+45       9.6907      0.36  Q          |          |          |        V |
---------------------------------------------------------------------------
```

```
        U n i t   H y d r o g r a p h   A n a l y s i s

        Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0
               Study date  05/18/21 File: pra1003100.out


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------------------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6407

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =     5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           0.85                 83.18

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           2.00                195.72

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.850(In)
Area Averaged 100-Year Rainfall =    2.000(In)

Point rain (area averaged) =    2.000(In)
Areal adjustment factor =   99.96 %
Adjusted average point rain =    1.999(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50         0.442
 Total Area Entered =     97.86(Ac.)
```

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
70.5	85.3	0.184	0.442	0.111	1.000	0.111
					Sum (F) =	0.111

Area averaged mean soil loss (F) (In/Hr) = 0.111
Minimum soil loss rate ((In/Hr)) = 0.055
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	86.787	15.235	15.025
2	0.167	173.573	46.393	45.755
3	0.250	260.360	18.144	17.894
4	0.333	347.147	7.825	7.718
5	0.417	433.934	4.607	4.543
6	0.500	520.720	2.894	2.854
7	0.583	607.507	2.036	2.008
8	0.667	694.294	1.334	1.316
9	0.750	781.080	0.909	0.897
10	0.833	867.867	0.623	0.615
			Sum = 100.000	Sum= 98.625

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.312	0.111	(	0.170)	0.201
2	0.17	1.30	0.312	0.111	(	0.170)	0.201
3	0.25	1.10	0.264	0.111	(	0.144)	0.153
4	0.33	1.50	0.360	0.111	(	0.197)	0.249
5	0.42	1.50	0.360	0.111	(	0.197)	0.249
6	0.50	1.80	0.432	0.111	(	0.236)	0.321
7	0.58	1.50	0.360	0.111	(	0.197)	0.249
8	0.67	1.80	0.432	0.111	(	0.236)	0.321
9	0.75	1.80	0.432	0.111	(	0.236)	0.321
10	0.83	1.50	0.360	0.111	(	0.197)	0.249
11	0.92	1.60	0.384	0.111	(	0.210)	0.273
12	1.00	1.80	0.432	0.111	(	0.236)	0.321
13	1.08	2.20	0.528	0.111	(	0.288)	0.417
14	1.17	2.20	0.528	0.111	(	0.288)	0.417
15	1.25	2.20	0.528	0.111	(	0.288)	0.417
16	1.33	2.00	0.480	0.111	(	0.262)	0.369
17	1.42	2.60	0.624	0.111	(	0.341)	0.513
18	1.50	2.70	0.648	0.111	(	0.354)	0.537
19	1.58	2.40	0.576	0.111	(	0.315)	0.465
20	1.67	2.70	0.648	0.111	(	0.354)	0.537
21	1.75	3.30	0.792	0.111	(	0.433)	0.681
22	1.83	3.10	0.744	0.111	(	0.406)	0.633
23	1.92	2.90	0.696	0.111	(	0.380)	0.585
24	2.00	3.00	0.720	0.111	(	0.393)	0.609
25	2.08	3.10	0.744	0.111	(	0.406)	0.633
26	2.17	4.20	1.008	0.111	(	0.550)	0.897
27	2.25	5.00	1.199	0.111	(	0.655)	1.089
28	2.33	3.50	0.840	0.111	(	0.459)	0.729
29	2.42	6.80	1.631	0.111	(	0.891)	1.521
30	2.50	7.30	1.751	0.111	(	0.957)	1.641
31	2.58	8.20	1.967	0.111	(	1.075)	1.857
32	2.67	5.90	1.415	0.111	(	0.773)	1.305
33	2.75	2.00	0.480	0.111	(	0.262)	0.369
34	2.83	1.80	0.432	0.111	(	0.236)	0.321
35	2.92	1.80	0.432	0.111	(	0.236)	0.321
36	3.00	0.60	0.144	(0.111)		0.079	0.065

```
              (Loss Rate Not Used)
    Sum =     100.0                                  Sum =    20.0
       Flood volume = Effective rainfall      1.67(In)
        times area      97.9(Ac.)/[(In)/(Ft.)] =      13.6(Ac.Ft)
       Total soil loss =      0.33(In)
       Total soil loss =     2.683(Ac.Ft)
       Total rainfall =      2.00(In)
       Flood volume =      593306.7 Cubic Feet
       Total soil loss =      116852.7 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =    155.692(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ---------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
 ---------------------------------------------------------------------------
   0+ 5       0.0208      3.03  Q         |         |         |         |
   0+10       0.1052     12.24  V Q       |         |         |         |
   0+15       0.2093     15.13  V  Q      |         |         |         |
   0+20       0.3190     15.93  V  Q      |         |         |         |
   0+25       0.4594     20.38  |V  Q     |         |         |         |
   0+30       0.6204     23.38  |V  Q     |         |         |         |
   0+35       0.8030     26.52  | V  Q    |         |         |         |
   0+40       0.9832     26.16  | V  Q    |         |         |         |
   0+45       1.1835     29.08  |  V Q    |         |         |         |
   0+50       1.3854     29.31  |   VQ    |         |         |         |
   0+55       1.5706     26.90  |   VQ    |         |         |         |
   1+ 0       1.7617     27.75  |    Q    |         |         |         |
   1+ 5       1.9785     31.48  |    VQ   |         |         |         |
   1+10       2.2313     36.70  |     VQ  |         |         |         |
   1+15       2.4982     38.77  |      Q  |         |         |         |
   1+20       2.7665     38.95  |      QV |         |         |         |
   1+25       3.0385     39.49  |      QV |         |         |         |
   1+30       3.3547     45.92  |        Q|         |         |         |
   1+35       3.6878     48.37  |        QV         |         |         |
   1+40       4.0161     47.67  |        Q|V        |         |         |
   1+45       4.3787     52.65  |         Q V       |         |         |
   1+50       4.7902     59.74  |          |Q  V     |         |         |
   1+55       5.2028     59.92  |          |Q   V    |         |         |
   2+ 0       5.6068     58.65  |          |Q    V   |         |         |
   2+ 5       6.0181     59.73  |          |Q     V  |         |         |
   2+10       6.4672     65.21  |          |  Q    V |         |         |
   2+15       7.0235     80.77  |          |     Q   V         |         |
   2+20       7.6373     89.14  |          |      Q  | V       |         |
   2+25       8.2588     90.23  |          |       Q |   V     |         |
   2+30       9.1170    124.61  |          |         |   Q V   |         |
   2+35      10.1251    146.38  |          |         |        Q|         |
   2+40      11.1973    155.69  |          |         |         |QV       |
   2+45      12.0548    124.50  |          |         |   Q     |    V    |
   2+50      12.5735     75.32  |          |    Q    |         |     V   |
   2+55      12.9516     54.89  |          |Q        |         |       V |
   3+ 0      13.2419     42.15  |        Q |         |         |       V |
   3+ 5      13.4094     24.33  |   Q      |         |         |        V|
   3+10      13.5034     13.64  | Q        |         |         |        V|
   3+15      13.5586      8.02  |Q         |         |         |        V|
   3+20      13.5907      4.66  Q          |         |         |        V|
   3+25      13.6071      2.39  Q          |         |         |        V|
   3+30      13.6145      1.07  Q          |         |         |        V|
   3+35      13.6184      0.57  Q          |         |         |        V|
   3+40      13.6202      0.26  Q          |         |         |        V|
   3+45      13.6204      0.04  Q          |         |         |         V
---------------------------------------------------------------------------
```

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  05/18/21 File: pra1006100.out


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------------------------------------------------------------------------------

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6407

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =     5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           1.20                117.43

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           3.00                293.58

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.200(In)
Area Averaged 100-Year Rainfall =    3.000(In)

Point rain (area averaged) =    3.000(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    2.999(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50         0.442
 Total Area Entered =     97.86(Ac.)
```

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
70.5	85.3	0.184	0.442	0.111	1.000	0.111
					Sum (F) =	0.111

Area averaged mean soil loss (F) (In/Hr) = 0.111
Minimum soil loss rate ((In/Hr)) = 0.055
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	86.787	15.235	15.025
2	0.167	173.573	46.393	45.755
3	0.250	260.360	18.144	17.894
4	0.333	347.147	7.825	7.718
5	0.417	433.934	4.607	4.543
6	0.500	520.720	2.894	2.854
7	0.583	607.507	2.036	2.008
8	0.667	694.294	1.334	1.316
9	0.750	781.080	0.909	0.897
10	0.833	867.867	0.623	0.615
			Sum = 100.000	Sum= 98.625

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.111)	0.098	0.082
2	0.17	0.60	0.216	0.111	(0.118)	0.105
3	0.25	0.60	0.216	0.111	(0.118)	0.105
4	0.33	0.60	0.216	0.111	(0.118)	0.105
5	0.42	0.60	0.216	0.111	(0.118)	0.105
6	0.50	0.70	0.252	0.111	(0.138)	0.141
7	0.58	0.70	0.252	0.111	(0.138)	0.141
8	0.67	0.70	0.252	0.111	(0.138)	0.141
9	0.75	0.70	0.252	0.111	(0.138)	0.141
10	0.83	0.70	0.252	0.111	(0.138)	0.141
11	0.92	0.70	0.252	0.111	(0.138)	0.141
12	1.00	0.80	0.288	0.111	(0.157)	0.177
13	1.08	0.80	0.288	0.111	(0.157)	0.177
14	1.17	0.80	0.288	0.111	(0.157)	0.177
15	1.25	0.80	0.288	0.111	(0.157)	0.177
16	1.33	0.80	0.288	0.111	(0.157)	0.177
17	1.42	0.80	0.288	0.111	(0.157)	0.177
18	1.50	0.80	0.288	0.111	(0.157)	0.177
19	1.58	0.80	0.288	0.111	(0.157)	0.177
20	1.67	0.80	0.288	0.111	(0.157)	0.177
21	1.75	0.80	0.288	0.111	(0.157)	0.177
22	1.83	0.80	0.288	0.111	(0.157)	0.177
23	1.92	0.80	0.288	0.111	(0.157)	0.177
24	2.00	0.90	0.324	0.111	(0.177)	0.213
25	2.08	0.80	0.288	0.111	(0.157)	0.177
26	2.17	0.90	0.324	0.111	(0.177)	0.213
27	2.25	0.90	0.324	0.111	(0.177)	0.213
28	2.33	0.90	0.324	0.111	(0.177)	0.213
29	2.42	0.90	0.324	0.111	(0.177)	0.213
30	2.50	0.90	0.324	0.111	(0.177)	0.213
31	2.58	0.90	0.324	0.111	(0.177)	0.213
32	2.67	0.90	0.324	0.111	(0.177)	0.213
33	2.75	1.00	0.360	0.111	(0.197)	0.249
34	2.83	1.00	0.360	0.111	(0.197)	0.249
35	2.92	1.00	0.360	0.111	(0.197)	0.249
36	3.00	1.00	0.360	0.111	(0.197)	0.249

```
 37   3.08     1.00      0.360          0.111    (  0.197)        0.249
 38   3.17     1.10      0.396          0.111    (  0.216)        0.285
 39   3.25     1.10      0.396          0.111    (  0.216)        0.285
 40   3.33     1.10      0.396          0.111    (  0.216)        0.285
 41   3.42     1.20      0.432          0.111    (  0.236)        0.321
 42   3.50     1.30      0.468          0.111    (  0.256)        0.357
 43   3.58     1.40      0.504          0.111    (  0.275)        0.393
 44   3.67     1.40      0.504          0.111    (  0.275)        0.393
 45   3.75     1.50      0.540          0.111    (  0.295)        0.429
 46   3.83     1.50      0.540          0.111    (  0.295)        0.429
 47   3.92     1.60      0.576          0.111    (  0.315)        0.465
 48   4.00     1.60      0.576          0.111    (  0.315)        0.465
 49   4.08     1.70      0.612          0.111    (  0.334)        0.501
 50   4.17     1.80      0.648          0.111    (  0.354)        0.537
 51   4.25     1.90      0.684          0.111    (  0.374)        0.573
 52   4.33     2.00      0.720          0.111    (  0.393)        0.609
 53   4.42     2.10      0.756          0.111    (  0.413)        0.645
 54   4.50     2.10      0.756          0.111    (  0.413)        0.645
 55   4.58     2.20      0.792          0.111    (  0.433)        0.681
 56   4.67     2.30      0.828          0.111    (  0.452)        0.717
 57   4.75     2.40      0.864          0.111    (  0.472)        0.753
 58   4.83     2.40      0.864          0.111    (  0.472)        0.753
 59   4.92     2.50      0.900          0.111    (  0.492)        0.789
 60   5.00     2.60      0.936          0.111    (  0.511)        0.825
 61   5.08     3.10      1.116          0.111    (  0.609)        1.005
 62   5.17     3.60      1.296          0.111    (  0.708)        1.185
 63   5.25     3.90      1.404          0.111    (  0.767)        1.293
 64   5.33     4.20      1.511          0.111    (  0.826)        1.401
 65   5.42     4.70      1.691          0.111    (  0.924)        1.581
 66   5.50     5.60      2.015          0.111    (  1.101)        1.905
 67   5.58     1.90      0.684          0.111    (  0.374)        0.573
 68   5.67     0.90      0.324          0.111    (  0.177)        0.213
 69   5.75     0.60      0.216          0.111    (  0.118)        0.105
 70   5.83     0.50      0.180       (  0.111)       0.098        0.082
 71   5.92     0.30      0.108       (  0.111)       0.059        0.049
 72   6.00     0.20      0.072       (  0.111)       0.039        0.033
             (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    28.2
      Flood volume = Effective rainfall      2.35(In)
       times area      97.9(Ac.)/[(In)/(Ft.)] =      19.1(Ac.Ft)
      Total soil loss =      0.65(In)
      Total soil loss =     5.308(Ac.Ft)
      Total rainfall =      3.00(In)
      Flood volume =      834101.2 Cubic Feet
      Total soil loss =      231235.7 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    148.475(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
-------------------------------------------------------------------------
  0+ 5       0.0085      1.23  Q        |         |         |         |
  0+10       0.0451      5.32  VQ       |         |         |         |
  0+15       0.0993      7.87  VQ       |         |         |         |
  0+20       0.1608      8.93  VQ       |         |         |         |
  0+25       0.2261      9.48  VQ       |         |         |         |
  0+30       0.2974     10.36  V Q      |         |         |         |
  0+35       0.3818     12.24  V Q      |         |         |         |
  0+40       0.4716     13.04  V Q      |         |         |         |
  0+45       0.5640     13.42  |VQ      |         |         |         |
  0+50       0.6581     13.66  |VQ      |         |         |         |
  0+55       0.7530     13.78  |VQ      |         |         |         |
  1+ 0       0.8521     14.39  |VQ      |         |         |         |
  1+ 5       0.9629     16.08  | VQ     |         |         |         |
  1+10       1.0783     16.76  | VQ     |         |         |         |
  1+15       1.1958     17.06  | VQ     |         |         |         |
  1+20       1.3144     17.22  | VQ     |         |         |         |
```

```
   1+25       1.4338     17.33  | VQ      |         |         |         |
   1+30       1.5536     17.40  |  Q      |         |         |         |
   1+35       1.6738     17.45  |  Q      |         |         |         |
   1+40       1.7942     17.48  |  Q      |         |         |         |
   1+45       1.9147     17.50  |  Q      |         |         |         |
   1+50       2.0352     17.50  |  QV     |         |         |         |
   1+55       2.1558     17.50  |  QV     |         |         |         |
   2+ 0       2.2800     18.04  |  QV     |         |         |         |
   2+ 5       2.4119     19.15  |  Q V    |         |         |         |
   2+10       2.5406     18.69  |  Q V    |         |         |         |
   2+15       2.6781     19.97  |  Q V    |         |         |         |
   2+20       2.8193     20.50  |   QV    |         |         |         |
   2+25       2.9620     20.72  |   Q V   |         |         |         |
   2+30       3.1055     20.85  |   Q V   |         |         |         |
   2+35       3.2497     20.93  |   Q V   |         |         |         |
   2+40       3.3942     20.98  |   Q  V  |         |         |         |
   2+45       3.5427     21.56  |   Q  V  |         |         |         |
   2+50       3.7026     23.22  |   Q  V  |         |         |         |
   2+55       3.8671     23.89  |   Q   V |         |         |         |
   3+ 0       4.0335     24.16  |   Q   V |         |         |         |
   3+ 5       4.2011     24.33  |   Q   V |         |         |         |
   3+10       4.3730     24.97  |   Q    V|         |         |         |
   3+15       4.5569     26.69  |    Q   V|         |         |         |
   3+20       4.7454     27.38  |    Q   V|         |         |         |
   3+25       4.9399     28.23  |    Q    V         |         |         |
   3+30       5.1507     30.61  |     Q   V         |         |         |
   3+35       5.3817     33.54  |     Q   |V        |         |         |
   3+40       5.6309     36.19  |      Q  |V        |         |         |
   3+45       5.8916     37.86  |      Q  | V       |         |         |
   3+50       6.1677     40.08  |       Q | V       |         |         |
   3+55       6.4544     41.63  |       Q |  V      |         |         |
   4+ 0       6.7559     43.78  |       Q |   V     |         |         |
   4+ 5       7.0677     45.28  |        Q|   V     |         |         |
   4+10       7.3980     47.95  |        Q|    V    |         |         |
   4+15       7.7497     51.07  |         Q     V   |         |         |
   4+20       8.1241     54.36  |         Q     V   |         |         |
   4+25       8.5217     57.73  |         |Q     V  |         |         |
   4+30       8.9393     60.64  |         | Q     V |         |         |
   4+35       9.3696     62.47  |         | Q      V|         |         |
   4+40       9.8196     65.35  |         |  Q      V         |         |
   4+45      10.2921     68.60  |         |  Q      |V        |         |
   4+50      10.7841     71.45  |         |   Q     | V       |         |
   4+55      11.2886     73.25  |         |   Q     |  V      |         |
   5+ 0      11.8125     76.08  |         |    Q    |   V     |         |
   5+ 5      12.3736     81.47  |         |     Q   |    V    |         |
   5+10      13.0181     93.58  |         |       Q |      V  |         |
   5+15      13.7568    107.26  |         |         |Q      V |         |
   5+20      14.5750    118.80  |         |         |  Q      V         |
   5+25      15.4759    130.82  |         |         |     Q   | V       |
   5+30      16.4964    148.16  |         |         |        Q|  V      |
   5+35      17.5189    148.47  |         |         |         Q|    V   |
   5+40      18.1439     90.75  |         |       Q |          |     V  |
   5+45      18.5094     53.08  |        Q|         |          |      V |
   5+50      18.7413     33.67  |     Q   |         |          |       V|
   5+55      18.8995     22.96  |   Q     |         |          |       V|
   6+ 0      19.0067     15.58  |  Q      |         |          |       V|
   6+ 5      19.0758     10.03  | Q       |         |          |       V|
   6+10      19.1137      5.50  |Q        |         |          |       V|
   6+15      19.1336      2.89  Q         |         |          |       V|
   6+20      19.1414      1.14  Q         |         |          |       V|
   6+25      19.1450      0.52  Q         |         |          |       V|
   6+30      19.1468      0.27  Q         |         |          |       V|
   6+35      19.1478      0.14  Q         |         |          |       V|
   6+40      19.1482      0.06  Q         |         |          |       V|
   6+45      19.1483      0.02  Q         |         |          |       V|
-------------------------------------------------------------------------
```

```
        U n i t   H y d r o g r a p h   A n a l y s i s

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               Study date  11/08/21 File: PRA10024100.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR  HOUR STORM
HUNSAKER & ASSOCIATES,  BRIAN LOWELL, PE
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Drainage Area =      97.86(Ac.)  =      0.153 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      97.86(Ac.)  =      0.153 Sq. Mi.
Length along longest watercourse =    5833.00(Ft.)
Length along longest watercourse measured to centroid =    2440.00(Ft.)
Length along longest watercourse =      1.105 Mi.
Length along longest watercourse measured to centroid =      0.462 Mi.
Difference in elevation =     302.00(Ft.)
Slope along watercourse =    273.3688 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =    0.096 Hr.
Lag time =     5.76 Min.
25% of lag time =     1.44 Min.
40% of lag time =     2.30 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           2.00                195.72

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       97.86           5.00                489.30

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    2.000(In)
Area Averaged 100-Year Rainfall =    5.000(In)

Point rain (area averaged) =    5.000(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    4.999(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    97.860           70.50          0.442
 Total Area Entered =     97.86(Ac.)
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RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
70.5	85.3	0.184	0.442	0.111	1.000	0.111
					Sum (F) =	0.111

Area averaged mean soil loss (F) (In/Hr) = 0.111
Minimum soil loss rate ((In/Hr)) = 0.055
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	260.360	52.212	51.493
2	0.500	520.720	39.421	38.879
3	0.750	781.080	6.693	6.601
4	1.000	1041.441	1.674	1.651
		Sum = 100.000	Sum=	98.625

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.040	(0.195)	0.022	0.018
2	0.50	0.30	0.060	(0.193)	0.033	0.027
3	0.75	0.30	0.060	(0.191)	0.033	0.027
4	1.00	0.40	0.080	(0.188)	0.044	0.036
5	1.25	0.30	0.060	(0.186)	0.033	0.027
6	1.50	0.30	0.060	(0.184)	0.033	0.027
7	1.75	0.30	0.060	(0.182)	0.033	0.027
8	2.00	0.40	0.080	(0.180)	0.044	0.036
9	2.25	0.40	0.080	(0.177)	0.044	0.036
10	2.50	0.40	0.080	(0.175)	0.044	0.036
11	2.75	0.50	0.100	(0.173)	0.055	0.045
12	3.00	0.50	0.100	(0.171)	0.055	0.045
13	3.25	0.50	0.100	(0.169)	0.055	0.045
14	3.50	0.50	0.100	(0.167)	0.055	0.045
15	3.75	0.50	0.100	(0.165)	0.055	0.045
16	4.00	0.60	0.120	(0.163)	0.066	0.054
17	4.25	0.60	0.120	(0.161)	0.066	0.054
18	4.50	0.70	0.140	(0.159)	0.076	0.064
19	4.75	0.70	0.140	(0.156)	0.076	0.064
20	5.00	0.80	0.160	(0.154)	0.087	0.073
21	5.25	0.60	0.120	(0.152)	0.066	0.054
22	5.50	0.70	0.140	(0.150)	0.076	0.064
23	5.75	0.80	0.160	(0.149)	0.087	0.073
24	6.00	0.80	0.160	(0.147)	0.087	0.073
25	6.25	0.90	0.180	(0.145)	0.098	0.082
26	6.50	0.90	0.180	(0.143)	0.098	0.082
27	6.75	1.00	0.200	(0.141)	0.109	0.091
28	7.00	1.00	0.200	(0.139)	0.109	0.091
29	7.25	1.00	0.200	(0.137)	0.109	0.091
30	7.50	1.10	0.220	(0.135)	0.120	0.100
31	7.75	1.20	0.240	(0.133)	0.131	0.109
32	8.00	1.30	0.260	0.131	(0.142)	0.129
33	8.25	1.50	0.300	0.130	(0.164)	0.170
34	8.50	1.50	0.300	0.128	(0.164)	0.172
35	8.75	1.60	0.320	0.126	(0.175)	0.194
36	9.00	1.70	0.340	0.124	(0.186)	0.216
37	9.25	1.90	0.380	0.122	(0.208)	0.257
38	9.50	2.00	0.400	0.121	(0.218)	0.279
39	9.75	2.10	0.420	0.119	(0.229)	0.301
40	10.00	2.20	0.440	0.117	(0.240)	0.323
41	10.25	1.50	0.300	0.116	(0.164)	0.184

42	10.50	1.50	0.300	0.114	(0.164)		0.186
43	10.75	2.00	0.400	0.112	(0.218)		0.288
44	11.00	2.00	0.400	0.111	(0.218)		0.289
45	11.25	1.90	0.380	0.109	(0.208)		0.271
46	11.50	1.90	0.380	0.107	(0.208)		0.273
47	11.75	1.70	0.340	0.106	(0.186)		0.234
48	12.00	1.80	0.360	0.104	(0.197)		0.256
49	12.25	2.50	0.500	0.103	(0.273)		0.397
50	12.50	2.60	0.520	0.101	(0.284)		0.419
51	12.75	2.80	0.560	0.100	(0.306)		0.460
52	13.00	2.90	0.580	0.098	(0.317)		0.482
53	13.25	3.40	0.680	0.097	(0.371)		0.583
54	13.50	3.40	0.680	0.095	(0.371)		0.585
55	13.75	2.30	0.460	0.094	(0.251)		0.366
56	14.00	2.30	0.460	0.092	(0.251)		0.368
57	14.25	2.70	0.540	0.091	(0.295)		0.449
58	14.50	2.60	0.520	0.089	(0.284)		0.430
59	14.75	2.60	0.520	0.088	(0.284)		0.432
60	15.00	2.50	0.500	0.087	(0.273)		0.413
61	15.25	2.40	0.480	0.085	(0.262)		0.394
62	15.50	2.30	0.460	0.084	(0.251)		0.376
63	15.75	1.90	0.380	0.083	(0.208)		0.297
64	16.00	1.90	0.380	0.082	(0.208)		0.298
65	16.25	0.40	0.080	(0.080)	0.044		0.036
66	16.50	0.40	0.080	(0.079)	0.044		0.036
67	16.75	0.30	0.060	(0.078)	0.033		0.027
68	17.00	0.30	0.060	(0.077)	0.033		0.027
69	17.25	0.50	0.100	(0.076)	0.055		0.045
70	17.50	0.50	0.100	(0.074)	0.055		0.045
71	17.75	0.50	0.100	(0.073)	0.055		0.045
72	18.00	0.40	0.080	(0.072)	0.044		0.036
73	18.25	0.40	0.080	(0.071)	0.044		0.036
74	18.50	0.40	0.080	(0.070)	0.044		0.036
75	18.75	0.30	0.060	(0.069)	0.033		0.027
76	19.00	0.20	0.040	(0.068)	0.022		0.018
77	19.25	0.30	0.060	(0.067)	0.033		0.027
78	19.50	0.40	0.080	(0.066)	0.044		0.036
79	19.75	0.30	0.060	(0.065)	0.033		0.027
80	20.00	0.20	0.040	(0.064)	0.022		0.018
81	20.25	0.30	0.060	(0.064)	0.033		0.027
82	20.50	0.30	0.060	(0.063)	0.033		0.027
83	20.75	0.30	0.060	(0.062)	0.033		0.027
84	21.00	0.20	0.040	(0.061)	0.022		0.018
85	21.25	0.30	0.060	(0.061)	0.033		0.027
86	21.50	0.20	0.040	(0.060)	0.022		0.018
87	21.75	0.30	0.060	(0.059)	0.033		0.027
88	22.00	0.20	0.040	(0.059)	0.022		0.018
89	22.25	0.30	0.060	(0.058)	0.033		0.027
90	22.50	0.20	0.040	(0.057)	0.022		0.018
91	22.75	0.20	0.040	(0.057)	0.022		0.018
92	23.00	0.20	0.040	(0.056)	0.022		0.018
93	23.25	0.20	0.040	(0.056)	0.022		0.018
94	23.50	0.20	0.040	(0.056)	0.022		0.018
95	23.75	0.20	0.040	(0.055)	0.022		0.018
96	24.00	0.20	0.040	(0.055)	0.022		0.018

(Loss Rate Not Used)

Sum = 100.0 Sum = 13.4

Flood volume = Effective rainfall 3.35(In)
times area 97.9(Ac.)/[(In)/(Ft.)] = 27.3(Ac.Ft)
Total soil loss = 1.65(In)
Total soil loss = 13.481(Ac.Ft)
Total rainfall = 5.00(In)
Flood volume = 1188608.4 Cubic Feet
Total soil loss = 587211.1 Cubic Feet

Peak flow rate of this hydrograph = 56.754(CFS)

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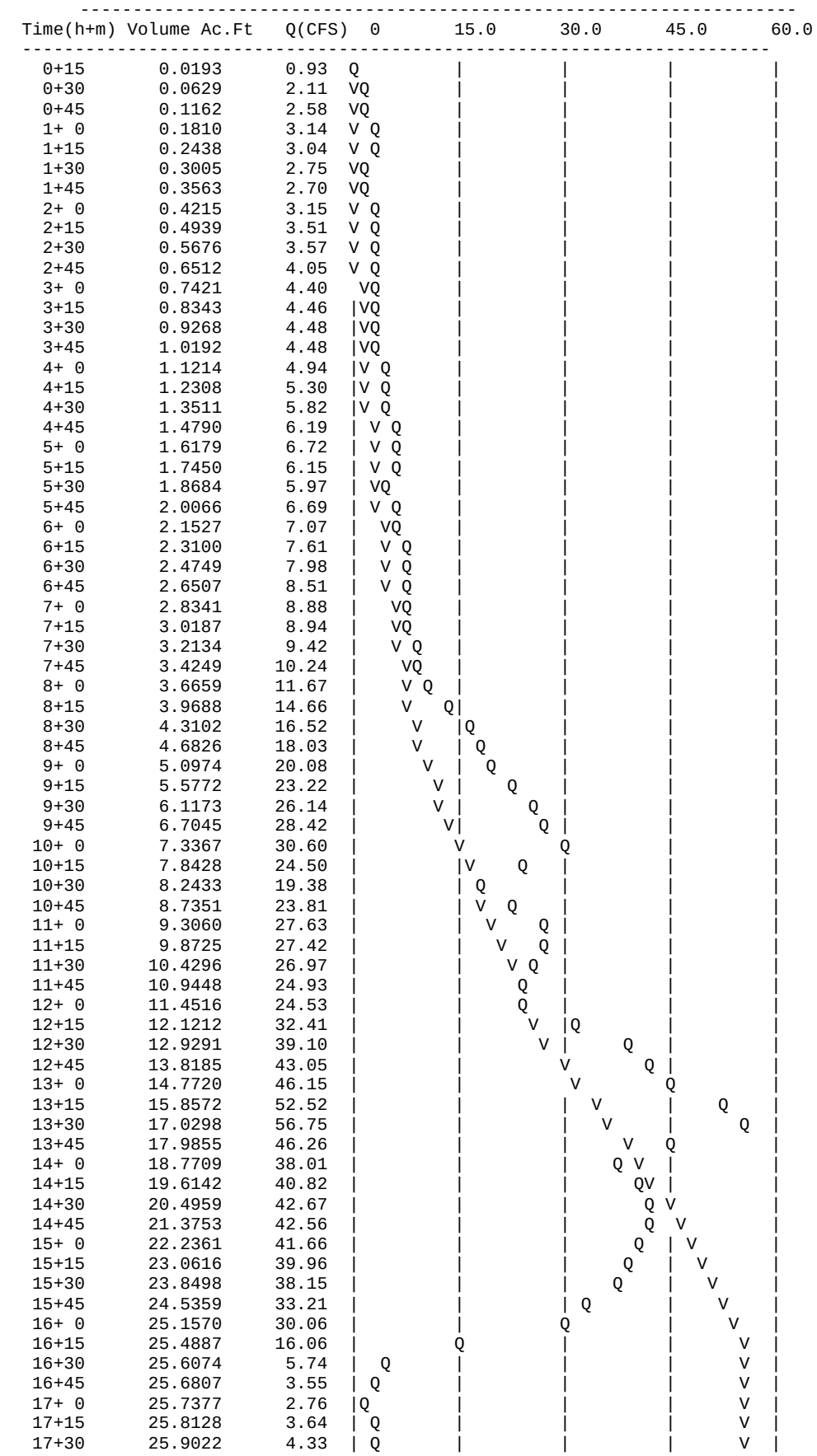
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))


Time(h+m) Volume Ac.Ft Q(CFS) 0 15.0 30.0 45.0 60.0
0+15 0.0193 0.93
0+30 0.0629 2.11
0+45 0.1162 2.58
1+ 0 0.1810 3.14
1+15 0.2438 3.04
1+30 0.3005 2.75
1+45 0.3563 2.70
2+ 0 0.4215 3.15
2+15 0.4939 3.51
2+30 0.5676 3.57
2+45 0.6512 4.05
3+ 0 0.7421 4.40
3+15 0.8343 4.46
3+30 0.9268 4.48
3+45 1.0192 4.48
4+ 0 1.1214 4.94
4+15 1.2308 5.30
4+30 1.3511 5.82
4+45 1.4790 6.19
5+ 0 1.6179 6.72
5+15 1.7450 6.15
5+30 1.8684 5.97
5+45 2.0066 6.69
6+ 0 2.1527 7.07
6+15 2.3100 7.61
6+30 2.4749 7.98
6+45 2.6507 8.51
7+ 0 2.8341 8.88
7+15 3.0187 8.94
7+30 3.2134 9.42
7+45 3.4249 10.24
8+ 0 3.6659 11.67
8+15 3.9688 14.66
8+30 4.3102 16.52
8+45 4.6826 18.03
9+ 0 5.0974 20.08
9+15 5.5772 23.22
9+30 6.1173 26.14
9+45 6.7045 28.42
10+ 0 7.3367 30.60
10+15 7.8428 24.50
10+30 8.2433 19.38
10+45 8.7351 23.81
11+ 0 9.3060 27.63
11+15 9.8725 27.42
11+30 10.4296 26.97
11+45 10.9448 24.93
12+ 0 11.4516 24.53
12+15 12.1212 32.41
12+30 12.9291 39.10
12+45 13.8185 43.05
13+ 0 14.7720 46.15
13+15 15.8572 52.52
13+30 17.0298 56.75
13+45 17.9855 46.26
14+ 0 18.7709 38.01
14+15 19.6142 40.82
14+30 20.4959 42.67
14+45 21.3753 42.56
15+ 0 22.2361 41.66
15+15 23.0616 39.96
15+30 23.8498 38.15
15+45 24.5359 33.21
16+ 0 25.1570 30.06
16+15 25.4887 16.06
16+30 25.6074 5.74
16+45 25.6807 3.55
17+ 0 25.7377 2.76
17+15 25.8128 3.64
17+30 25.9022 4.33

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  17+45      25.9940      4.45  | Q       |         |         |       V |
  18+ 0      26.0769      4.01  | Q       |         |         |       V |
  18+15      26.1524      3.66  | Q       |         |         |       V |
  18+30      26.2267      3.60  | Q       |         |         |       V |
  18+45      26.2910      3.11  | Q       |         |         |       V |
  19+ 0      26.3384      2.29  |Q        |         |         |       V |
  19+15      26.3869      2.35  |Q        |         |         |       V |
  19+30      26.4508      3.09  | Q       |         |         |       V |
  19+45      26.5132      3.02  | Q       |         |         |       V |
  20+ 0      26.5603      2.28  |Q        |         |         |       V |
  20+15      26.6088      2.35  |Q        |         |         |        V|
  20+30      26.6631      2.63  |Q        |         |         |        V|
  20+45      26.7182      2.67  |Q        |         |         |        V|
  21+ 0      26.7641      2.22  |Q        |         |         |        V|
  21+15      26.8123      2.33  |Q        |         |         |        V|
  21+30      26.8569      2.16  |Q        |         |         |        V|
  21+45      26.9047      2.32  |Q        |         |         |        V|
  22+ 0      26.9493      2.16  |Q        |         |         |        V|
  22+15      26.9972      2.32  |Q        |         |         |        V|
  22+30      27.0418      2.16  |Q        |         |         |        V|
  22+45      27.0800      1.85  |Q        |         |         |        V|
  23+ 0      27.1173      1.81  |Q        |         |         |        V|
  23+15      27.1543      1.79  |Q        |         |         |        V|
  23+30      27.1913      1.79  |Q        |         |         |        V|
  23+45      27.2283      1.79  |Q        |         |         |        V|
  24+ 0      27.2653      1.79  |Q        |         |         |        V|
  24+15      27.2830      0.86  Q         |         |         |        V|
  24+30      27.2861      0.15  Q         |         |         |        V|
  24+45      27.2867      0.03  Q         |         |         |         V
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Area C

- Area 'C' – 2 Year Pre-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 02/07/19  File:EXC002.out
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TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'C'
EXISTING CONDITION - RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE
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 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

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Program License Serial Number 6407

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Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.550(In/Hr)
Slope of intensity duration curve = 0.5300




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Process from Point/Station      301.000 to Point/Station      302.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   756.000(Ft.)
Top (of initial area) elevation =  1719.000(Ft.)
Bottom (of initial area) elevation =  1541.000(Ft.)
Difference in elevation =   178.000(Ft.)
Slope =    0.23545  s(percent)=      23.54
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.030 min.
Rainfall intensity =      1.419(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.585
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  63.56
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      5.231(CFS)
Total initial stream area =        6.300(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      302.000 to Point/Station      303.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1548.000(Ft.)
End of natural channel elevation =   1528.000(Ft.)
Length of natural channel  =   660.000(Ft.)
Estimated mean flow rate at midpoint of channel =     10.337(CFS)
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Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   4.39(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0303
Corrected/adjusted channel slope =  0.0303
Travel time =    2.51 min.     TC =   12.54  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.558
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.200
RI index for soil(AMC 1)  =  63.28
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.261(In/Hr) for a     2.0 year storm
Subarea runoff =      8.652(CFS) for     12.300(Ac.)
Total runoff =     13.882(CFS)       Total area =      18.600(Ac.)
End of computations, total study area =           18.60 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  80.3
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- Area 'C' – 10 Year Pre-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 02/07/19  File:EXC010.out
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TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'C'
EXISTING CONDITION - RATIONAL METHOD - 10 YEAR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

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Program License Serial Number 6407

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.859(In/Hr)
Slope of intensity duration curve = 0.5300




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Process from Point/Station      301.000 to Point/Station      302.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   756.000(Ft.)
Top (of initial area) elevation =  1719.000(Ft.)
Bottom (of initial area) elevation =  1541.000(Ft.)
Difference in elevation =   178.000(Ft.)
Slope =    0.23545  s(percent)=      23.54
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.030 min.
Rainfall intensity =      2.216(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.785
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  80.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     10.955(CFS)
Total initial stream area =        6.300(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      302.000 to Point/Station      303.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1548.000(Ft.)
End of natural channel elevation =   1528.000(Ft.)
Length of natural channel  =   660.000(Ft.)
Estimated mean flow rate at midpoint of channel =     21.650(CFS)
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Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   5.33(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0303
Corrected/adjusted channel slope =  0.0303
Travel time =    2.06 min.     TC =   12.09  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.773
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.200
RI index for soil(AMC 2)  =  80.20
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.006(In/Hr) for a    10.0 year storm
Subarea runoff =     19.081(CFS) for     12.300(Ac.)
Total runoff =     30.036(CFS)       Total area =      18.600(Ac.)
End of computations, total study area =           18.60 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  80.3
```

- Area 'C' – 100 Year Pre-Development Condition – Rational Method

```
                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 02/07/19  File:EXC100.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'C'
EXISTING CONDITION - RATIONAL METHOD - 100 YEAR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

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Program License Serial Number 6407

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 3

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.300(In/Hr)
Slope of intensity duration curve = 0.5300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   756.000(Ft.)
Top (of initial area) elevation =  1719.000(Ft.)
Bottom (of initial area) elevation =  1541.000(Ft.)
Difference in elevation =   178.000(Ft.)
Slope =    0.23545  s(percent)=      23.54
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.030 min.
Rainfall intensity =      3.355(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.867
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  91.24
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =     18.323(CFS)
Total initial stream area =        6.300(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      303.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
____________________________________________________________________________
Top of natural channel elevation =   1548.000(Ft.)
End of natural channel elevation =   1528.000(Ft.)
Length of natural channel  =   660.000(Ft.)
Estimated mean flow rate at midpoint of channel =     36.209(CFS)
```

```
Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   6.15(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0303
Corrected/adjusted channel slope =  0.0303
Travel time =    1.79 min.     TC =   11.82  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.864
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.200
RI index for soil(AMC 3)  =  91.12
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      3.075(In/Hr) for a   100.0 year storm
Subarea runoff =     32.662(CFS) for     12.300(Ac.)
Total runoff =     50.985(CFS)       Total area =      18.600(Ac.)
End of computations, total study area =           18.60 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  80.3
```

- Area 'C' – 2 Year Post-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/18/21  File:PRC002.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
DEVELOPED CONDITION RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6407

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.550(In/Hr)
Slope of intensity duration curve = 0.5300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   500.000(Ft.)
Top (of initial area) elevation =  1566.100(Ft.)
Bottom (of initial area) elevation =  1554.000(Ft.)
Difference in elevation =    12.100(Ft.)
Slope =    0.02420  s(percent)=       2.42
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.860 min.
Rainfall intensity =      1.432(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.619
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.127(CFS)
Total initial stream area =        1.270(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1546.000(Ft.)
Downstream point/station elevation =  1545.000(Ft.)
Pipe length  =    21.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.127(CFS)
Nearest computed pipe diameter  =      6.00(In.)
```

```
Calculated individual pipe flow  =     1.127(CFS)
Normal flow depth in pipe =    4.54(In.)
Flow top width inside pipe =    5.15(In.)
Critical depth could not be calculated.
Pipe flow velocity =      7.08(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =     9.91 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.270(Ac.)
Runoff from this stream =      1.127(CFS)
Time of concentration =    9.91 min.
Rainfall intensity =     1.428(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      303.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   535.000(Ft.)
Top (of initial area) elevation =  1566.100(Ft.)
Bottom (of initial area) elevation =  1554.000(Ft.)
Difference in elevation =    12.100(Ft.)
Slope =    0.02262  s(percent)=       2.26
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.269 min.
Rainfall intensity =      1.402(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.617
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.102(CFS)
Total initial stream area =        2.430(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      303.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1546.000(Ft.)
Downstream point/station elevation =  1545.000(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.102(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.102(CFS)
Normal flow depth in pipe =    5.53(In.)
Flow top width inside pipe =    8.76(In.)
Critical Depth =    7.85(In.)
Pipe flow velocity =      7.39(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    10.34 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      302.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.430(Ac.)
Runoff from this stream =      2.102(CFS)
Time of concentration =   10.34 min.
Rainfall intensity =     1.397(In/Hr)
Summary of stream data:
```

```
Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        1.127      9.91                1.428
2        2.102     10.34                1.397
Largest stream flow has longer time of concentration
Qp =      2.102 + sum of
          Qb         Ia/Ib
           1.127 *    0.978 =      1.102
Qp =      3.204

Total of 2 streams to confluence:
Flow rates before confluence point:
       1.127       2.102
Area of streams before confluence:
        1.270        2.430
Results of confluence:
Total flow rate =      3.204(CFS)
Time of concentration =    10.336 min.
Effective stream area after confluence =      3.700(Ac.)


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Process from Point/Station      302.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1545.000(Ft.)
Downstream point/station elevation =  1540.000(Ft.)
Pipe length  =   271.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.204(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.204(CFS)
Normal flow depth in pipe =    7.14(In.)
Flow top width inside pipe =   11.78(In.)
Critical Depth =    9.20(In.)
Pipe flow velocity =      6.59(Ft/s)
Travel time through pipe =    0.69 min.
Time of concentration (TC) =    11.02 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.700(Ac.)
Runoff from this stream =      3.204(CFS)
Time of concentration =   11.02 min.
Rainfall intensity =     1.350(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      305.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   215.000(Ft.)
Top (of initial area) elevation =  1554.000(Ft.)
Bottom (of initial area) elevation =  1553.500(Ft.)
Difference in elevation =     0.500(Ft.)
Slope =    0.00233  s(percent)=       0.23
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.239 min.
Rainfall intensity =      1.336(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.612
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
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Initial subarea runoff =      1.121(CFS)
Total initial stream area =        1.370(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      305.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1540.200(Ft.)
Downstream point/station elevation =  1540.000(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.121(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.121(CFS)
Normal flow depth in pipe =    5.43(In.)
Flow top width inside pipe =    8.81(In.)
Critical Depth =    5.84(In.)
Pipe flow velocity =      4.02(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    11.32 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.370(Ac.)
Runoff from this stream =      1.121(CFS)
Time of concentration =   11.32 min.
Rainfall intensity =     1.331(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        3.204     11.02                1.350
2        1.121     11.32                1.331
Largest stream flow has longer or shorter time of concentration
Qp =      3.204 + sum of
          Qa          Tb/Ta
           1.121 *    0.974 =      1.091
Qp =      4.296

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.204       1.121
Area of streams before confluence:
        3.700        1.370
Results of confluence:
Total flow rate =      4.296(CFS)
Time of concentration =    11.022 min.
Effective stream area after confluence =      5.070(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      306.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1540.000(Ft.)
Downstream point/station elevation =  1535.000(Ft.)
Pipe length  =   170.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.296(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.296(CFS)
Normal flow depth in pipe =    7.42(In.)
Flow top width inside pipe =   11.66(In.)
Critical Depth =   10.45(In.)
Pipe flow velocity =      8.42(Ft/s)
Travel time through pipe =    0.34 min.
Time of concentration (TC) =    11.36 min.
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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      306.100
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      5.070(Ac.)
Runoff from this stream =      4.296(CFS)
Time of concentration =   11.36 min.
Rainfall intensity =     1.329(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      307.000 to Point/Station      308.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   742.000(Ft.)
Top (of initial area) elevation =  1551.900(Ft.)
Bottom (of initial area) elevation =  1538.600(Ft.)
Difference in elevation =    13.300(Ft.)
Slope =    0.01792  s(percent)=       1.79
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.261 min.
Rainfall intensity =      1.276(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.633
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  41.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.608(CFS)
Total initial stream area =        3.230(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      306.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.000(Ft.)
Pipe length  =    48.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.608(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.608(CFS)
Normal flow depth in pipe =    6.05(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =    8.31(In.)
Pipe flow velocity =      6.57(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    12.38 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      306.200
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.230(Ac.)
Runoff from this stream =      2.608(CFS)
Time of concentration =   12.38 min.
Rainfall intensity =     1.269(In/Hr)
Program is now starting with Main Stream No. 3


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Process from Point/Station      309.000 to Point/Station      310.000
```

```
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   647.000(Ft.)
Top (of initial area) elevation =  1719.900(Ft.)
Bottom (of initial area) elevation =  1580.000(Ft.)
Difference in elevation =   139.900(Ft.)
Slope =    0.21623  s(percent)=      21.62
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.586 min.
Rainfall intensity =      1.454(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.629
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.700
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  68.04
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      2.231(CFS)
Total initial stream area =        2.440(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      306.300
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =  1580.000(Ft.)
Downstream point elevation =  1535.000(Ft.)
Channel length thru subarea  =   532.000(Ft.)
Channel base width     =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      3.384(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      3.384(CFS)
Depth of flow =   0.551(Ft.), Average velocity =  11.166(Ft/s)
Channel flow top width =    1.101(Ft.)
Flow Velocity =   11.17(Ft/s)
Travel time  =    0.79 min.
Time of concentration =   10.38 min.

Sub-Channel No. 1 Critical depth =      0.938(Ft.)
  '     '       '     Critical flow top width =      1.875(Ft.)
  '     '       '     Critical flow velocity=    3.850(Ft/s)
  '     '       '     Critical flow area =      0.879(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.601
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  65.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.394(In/Hr) for a     2.0 year storm
Subarea runoff =      2.254(CFS) for      2.690(Ac.)
Total runoff =      4.485(CFS)       Total area =       5.130(Ac.)
Depth of flow =   0.612(Ft.), Average velocity =  11.980(Ft/s)

Sub-Channel No. 1 Critical depth =      1.047(Ft.)
  '     '       '     Critical flow top width =      2.094(Ft.)
  '     '       '     Critical flow velocity=    4.092(Ft/s)
  '     '       '     Critical flow area =      1.096(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      306.300
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
```

```
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      5.130(Ac.)
Runoff from this stream =      4.485(CFS)
Time of concentration =   10.38 min.
Rainfall intensity =     1.394(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        4.296     11.36               1.329
2        2.608     12.38               1.269
3        4.485     10.38               1.394
Largest stream flow has longer or shorter time of concentration
Qp =      4.485 + sum of
          Qa          Tb/Ta
           4.296 *    0.914 =      3.926
          Qa          Tb/Ta
           2.608 *    0.838 =      2.187
Qp =     10.597

Total of 3 main streams to confluence:
Flow rates before confluence point:
       4.296       2.608       4.485
Area of streams before confluence:
        5.070        3.230        5.130


Results of confluence:
Total flow rate =     10.597(CFS)
Time of concentration =    10.380 min.
Effective stream area after confluence  =     13.430(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      306.300
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.620
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  67.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    10.38 min.
Rainfall intensity =      1.394(In/Hr) for a     2.0 year storm
Subarea runoff =      0.656(CFS) for      0.760(Ac.)
Total runoff =     11.254(CFS)       Total area =      14.190(Ac.)
End of computations, total study area =           14.19 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.708
Area averaged RI index number =  68.4
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- Area 'C' – 10 Year Post-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/18/21  File:PRC010.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
DEVELOPED CONDITION RATIONAL METHOD - 10 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6407

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =  10.0
Calculated rainfall intensity data:
1 hour intensity =  0.859(In/Hr)
Slope of intensity duration curve = 0.5300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   500.000(Ft.)
Top (of initial area) elevation =  1566.100(Ft.)
Bottom (of initial area) elevation =  1554.000(Ft.)
Difference in elevation =    12.100(Ft.)
Slope =    0.02420  s(percent)=       2.42
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.860 min.
Rainfall intensity =      2.236(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.756
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.148(CFS)
Total initial stream area =        1.270(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1546.000(Ft.)
Downstream point/station elevation =  1545.000(Ft.)
Pipe length  =    21.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.148(CFS)
Nearest computed pipe diameter  =      9.00(In.)
```

```
Calculated individual pipe flow  =     2.148(CFS)
Normal flow depth in pipe =    5.00(In.)
Flow top width inside pipe =    8.94(In.)
Critical Depth =    7.92(In.)
Pipe flow velocity =      8.52(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     9.90 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.270(Ac.)
Runoff from this stream =      2.148(CFS)
Time of concentration =    9.90 min.
Rainfall intensity =     2.231(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      303.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   535.000(Ft.)
Top (of initial area) elevation =  1566.100(Ft.)
Bottom (of initial area) elevation =  1554.000(Ft.)
Difference in elevation =    12.100(Ft.)
Slope =    0.02262  s(percent)=       2.26
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.269 min.
Rainfall intensity =      2.188(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.754
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      4.011(CFS)
Total initial stream area =        2.430(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1546.000(Ft.)
Downstream point/station elevation =  1545.000(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.011(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.011(CFS)
Normal flow depth in pipe =    6.81(In.)
Flow top width inside pipe =   11.89(In.)
Critical Depth =   10.18(In.)
Pipe flow velocity =      8.71(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    10.33 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      302.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.430(Ac.)
Runoff from this stream =      4.011(CFS)
Time of concentration =   10.33 min.
Rainfall intensity =     2.182(In/Hr)
Summary of stream data:
```

```
Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        2.148      9.90                2.231
2        4.011     10.33                2.182
Largest stream flow has longer time of concentration
Qp =      4.011 + sum of
          Qb         Ia/Ib
           2.148 *    0.978 =      2.101
Qp =      6.111

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.148       4.011
Area of streams before confluence:
        1.270        2.430
Results of confluence:
Total flow rate =      6.111(CFS)
Time of concentration =    10.326 min.
Effective stream area after confluence =      3.700(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1545.000(Ft.)
Downstream point/station elevation =  1540.000(Ft.)
Pipe length  =   271.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.111(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.111(CFS)
Normal flow depth in pipe =    9.21(In.)
Flow top width inside pipe =   14.60(In.)
Critical Depth =   11.99(In.)
Pipe flow velocity =      7.73(Ft/s)
Travel time through pipe =    0.58 min.
Time of concentration (TC) =    10.91 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.700(Ac.)
Runoff from this stream =      6.111(CFS)
Time of concentration =   10.91 min.
Rainfall intensity =     2.119(In/Hr)


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Process from Point/Station      303.000 to Point/Station      305.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   215.000(Ft.)
Top (of initial area) elevation =  1554.000(Ft.)
Bottom (of initial area) elevation =  1553.500(Ft.)
Difference in elevation =     0.500(Ft.)
Slope =    0.00233  s(percent)=       0.23
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.239 min.
Rainfall intensity =      2.086(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.750
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
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```
Initial subarea runoff =      2.142(CFS)
Total initial stream area =        1.370(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      305.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1540.200(Ft.)
Downstream point/station elevation =  1540.000(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.142(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.142(CFS)
Normal flow depth in pipe =    6.71(In.)
Flow top width inside pipe =   11.92(In.)
Critical Depth =    7.51(In.)
Pipe flow velocity =      4.74(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    11.31 min.


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Process from Point/Station      305.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.370(Ac.)
Runoff from this stream =      2.142(CFS)
Time of concentration =   11.31 min.
Rainfall intensity =     2.079(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        6.111     10.91                2.119
2        2.142     11.31                2.079
Largest stream flow has longer or shorter time of concentration
Qp =      6.111 + sum of
          Qa          Tb/Ta
           2.142 *    0.965 =      2.067
Qp =      8.178

Total of 2 streams to confluence:
Flow rates before confluence point:
       6.111       2.142
Area of streams before confluence:
        3.700        1.370
Results of confluence:
Total flow rate =      8.178(CFS)
Time of concentration =    10.911 min.
Effective stream area after confluence =      5.070(Ac.)


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Process from Point/Station      304.000 to Point/Station      306.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1540.000(Ft.)
Downstream point/station elevation =  1535.000(Ft.)
Pipe length  =   170.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.178(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     8.178(CFS)
Normal flow depth in pipe =    9.59(In.)
Flow top width inside pipe =   14.41(In.)
Critical Depth =   13.48(In.)
Pipe flow velocity =      9.88(Ft/s)
Travel time through pipe =    0.29 min.
Time of concentration (TC) =    11.20 min.
```

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Process from Point/Station      304.000 to Point/Station      306.100
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      5.070(Ac.)
Runoff from this stream =      8.178(CFS)
Time of concentration =   11.20 min.
Rainfall intensity =     2.090(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      307.000 to Point/Station      308.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   742.000(Ft.)
Top (of initial area) elevation =  1551.900(Ft.)
Bottom (of initial area) elevation =  1538.600(Ft.)
Difference in elevation =    13.300(Ft.)
Slope =    0.01792  s(percent)=       1.79
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.261 min.
Rainfall intensity =      1.992(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.768
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 2)  =  61.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      4.941(CFS)
Total initial stream area =        3.230(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      308.000 to Point/Station      306.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.000(Ft.)
Pipe length  =    48.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.941(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.941(CFS)
Normal flow depth in pipe =    9.45(In.)
Flow top width inside pipe =    9.82(In.)
Critical Depth =   10.96(In.)
Pipe flow velocity =      7.46(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =    12.37 min.


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Process from Point/Station      308.000 to Point/Station      306.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.230(Ac.)
Runoff from this stream =      4.941(CFS)
Time of concentration =   12.37 min.
Rainfall intensity =     1.983(In/Hr)
Program is now starting with Main Stream No. 3


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Process from Point/Station      309.000 to Point/Station      310.000
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**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   647.000(Ft.)
Top (of initial area) elevation =  1719.900(Ft.)
Bottom (of initial area) elevation =  1580.000(Ft.)
Difference in elevation =   139.900(Ft.)
Slope =    0.21623  s(percent)=      21.62
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.586 min.
Rainfall intensity =      2.269(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.807
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.700
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  83.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      4.469(CFS)
Total initial stream area =        2.440(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      310.000 to Point/Station      306.300
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =  1580.000(Ft.)
Downstream point elevation =  1535.000(Ft.)
Channel length thru subarea  =   532.000(Ft.)
Channel base width    =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      6.838(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      6.838(CFS)
Depth of flow =   0.717(Ft.), Average velocity =  13.312(Ft/s)
Channel flow top width =    1.433(Ft.)
Flow Velocity =   13.31(Ft/s)
Travel time  =    0.67 min.
Time of concentration =   10.25 min.

Sub-Channel No. 1 Critical depth =      1.234(Ft.)
  '     '       '     Critical flow top width =      2.469(Ft.)
  '     '       '     Critical flow velocity=    4.488(Ft/s)
  '     '       '     Critical flow area =      1.524(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.794
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  82.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.190(In/Hr) for a    10.0 year storm
Subarea runoff =      4.677(CFS) for      2.690(Ac.)
Total runoff =      9.146(CFS)       Total area =       5.130(Ac.)
Depth of flow =   0.799(Ft.), Average velocity =  14.316(Ft/s)

Sub-Channel No. 1 Critical depth =      1.391(Ft.)
  '     '       '     Critical flow top width =      2.781(Ft.)
  '     '       '     Critical flow velocity=    4.729(Ft/s)
  '     '       '     Critical flow area =      1.934(Sq.Ft)



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Process from Point/Station      310.000 to Point/Station      306.300
**** CONFLUENCE OF MAIN STREAMS ****
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The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      5.130(Ac.)
Runoff from this stream =      9.146(CFS)
Time of concentration =   10.25 min.
Rainfall intensity =     2.190(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        8.178     11.20               2.090
2        4.941     12.37               1.983
3        9.146     10.25               2.190
Largest stream flow has longer or shorter time of concentration
Qp =      9.146 + sum of
          Qa          Tb/Ta
           8.178 *    0.916 =      7.488
          Qa          Tb/Ta
           4.941 *    0.829 =      4.095
Qp =     20.728

Total of 3 main streams to confluence:
Flow rates before confluence point:
       8.178       4.941       9.146
Area of streams before confluence:
        5.070        3.230        5.130


Results of confluence:
Total flow rate =     20.728(CFS)
Time of concentration =    10.252 min.
Effective stream area after confluence  =     13.430(Ac.)


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Process from Point/Station      310.000 to Point/Station      306.300
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.803
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  83.50
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    10.25 min.
Rainfall intensity =      2.190(In/Hr) for a    10.0 year storm
Subarea runoff =      1.337(CFS) for      0.760(Ac.)
Total runoff =     22.066(CFS)       Total area =      14.190(Ac.)
End of computations, total study area =           14.19 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.708
Area averaged RI index number =  68.4
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- Area 'C' – 100 Year Post-Development Condition – Rational Method

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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
        Rational Hydrology Study        Date: 05/18/21  File:PRC100.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
DEVELOPED CONDITION RATIONAL METHOD - 100 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6407

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =  100.00 Antecedent Moisture Condition = 3

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity =  1.300(In/Hr)
Slope of intensity duration curve = 0.5300




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Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   500.000(Ft.)
Top (of initial area) elevation =  1566.100(Ft.)
Bottom (of initial area) elevation =  1554.000(Ft.)
Difference in elevation =    12.100(Ft.)
Slope =    0.02420  s(percent)=       2.42
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.860 min.
Rainfall intensity =      3.385(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.847
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.643(CFS)
Total initial stream area =        1.270(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1546.000(Ft.)
Downstream point/station elevation =  1545.000(Ft.)
Pipe length  =    21.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.643(CFS)
Nearest computed pipe diameter  =     12.00(In.)
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```
Calculated individual pipe flow  =     3.643(CFS)
Normal flow depth in pipe =    5.78(In.)
Flow top width inside pipe =   11.99(In.)
Critical Depth =    9.77(In.)
Pipe flow velocity =      9.74(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     9.90 min.


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Process from Point/Station      301.000 to Point/Station      302.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.270(Ac.)
Runoff from this stream =      3.643(CFS)
Time of concentration =    9.90 min.
Rainfall intensity =     3.379(In/Hr)


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Process from Point/Station      300.000 to Point/Station      303.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   535.000(Ft.)
Top (of initial area) elevation =  1566.100(Ft.)
Bottom (of initial area) elevation =  1554.000(Ft.)
Difference in elevation =    12.100(Ft.)
Slope =    0.02262  s(percent)=       2.26
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.269 min.
Rainfall intensity =      3.313(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.846
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      6.814(CFS)
Total initial stream area =        2.430(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      303.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1546.000(Ft.)
Downstream point/station elevation =  1545.000(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.814(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.814(CFS)
Normal flow depth in pipe =    8.18(In.)
Flow top width inside pipe =   14.94(In.)
Critical Depth =   12.57(In.)
Pipe flow velocity =      9.96(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    10.32 min.


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Process from Point/Station      303.000 to Point/Station      302.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.430(Ac.)
Runoff from this stream =      6.814(CFS)
Time of concentration =   10.32 min.
Rainfall intensity =     3.305(In/Hr)
Summary of stream data:
```

```
Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        3.643      9.90                 3.379
2        6.814     10.32                 3.305
Largest stream flow has longer time of concentration
Qp =      6.814 + sum of
          Qb         Ia/Ib
           3.643 *    0.978 =      3.563
Qp =     10.377

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.643       6.814
Area of streams before confluence:
        1.270        2.430
Results of confluence:
Total flow rate =     10.377(CFS)
Time of concentration =    10.319 min.
Effective stream area after confluence =      3.700(Ac.)


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Process from Point/Station      302.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1545.000(Ft.)
Downstream point/station elevation =  1540.000(Ft.)
Pipe length  =   271.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.377(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.377(CFS)
Normal flow depth in pipe =   11.39(In.)
Flow top width inside pipe =   17.35(In.)
Critical Depth =   14.86(In.)
Pipe flow velocity =      8.81(Ft/s)
Travel time through pipe =    0.51 min.
Time of concentration (TC) =    10.83 min.


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Process from Point/Station      302.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.700(Ac.)
Runoff from this stream =     10.377(CFS)
Time of concentration =   10.83 min.
Rainfall intensity =     3.221(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      305.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   215.000(Ft.)
Top (of initial area) elevation =  1554.000(Ft.)
Bottom (of initial area) elevation =  1553.500(Ft.)
Difference in elevation =     0.500(Ft.)
Slope =    0.00233  s(percent)=       0.23
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.239 min.
Rainfall intensity =      3.158(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.844
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
```

```
Initial subarea runoff =      3.652(CFS)
Total initial stream area =        1.370(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1540.200(Ft.)
Downstream point/station elevation =  1540.000(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.652(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.652(CFS)
Normal flow depth in pipe =    8.07(In.)
Flow top width inside pipe =   14.96(In.)
Critical Depth =    9.27(In.)
Pipe flow velocity =      5.43(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    11.30 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.370(Ac.)
Runoff from this stream =      3.652(CFS)
Time of concentration =   11.30 min.
Rainfall intensity =     3.149(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       10.377     10.83                3.221
2        3.652     11.30                3.149
Largest stream flow has longer or shorter time of concentration
Qp =     10.377 + sum of
          Qa          Tb/Ta
           3.652 *    0.959 =      3.500
Qp =     13.877

Total of 2 streams to confluence:
Flow rates before confluence point:
      10.377       3.652
Area of streams before confluence:
        3.700        1.370
Results of confluence:
Total flow rate =     13.877(CFS)
Time of concentration =    10.832 min.
Effective stream area after confluence =      5.070(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      306.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1540.000(Ft.)
Downstream point/station elevation =  1535.000(Ft.)
Pipe length  =   170.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.877(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    13.877(CFS)
Normal flow depth in pipe =   11.86(In.)
Flow top width inside pipe =   17.07(In.)
Critical Depth =   16.52(In.)
Pipe flow velocity =     11.25(Ft/s)
Travel time through pipe =    0.25 min.
Time of concentration (TC) =    11.08 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      306.100
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      5.070(Ac.)
Runoff from this stream =     13.877(CFS)
Time of concentration =   11.08 min.
Rainfall intensity =     3.182(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      307.000 to Point/Station      308.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   742.000(Ft.)
Top (of initial area) elevation =  1551.900(Ft.)
Bottom (of initial area) elevation =  1538.600(Ft.)
Difference in elevation =    13.300(Ft.)
Slope =    0.01792  s(percent)=       1.79
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.261 min.
Rainfall intensity =      3.016(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.854
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 3)  =  79.36
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      8.316(CFS)
Total initial stream area =        3.230(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      306.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.000(Ft.)
Pipe length  =    48.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.316(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     8.316(CFS)
Normal flow depth in pipe =   11.04(In.)
Flow top width inside pipe =   13.22(In.)
Critical Depth =   13.56(In.)
Pipe flow velocity =      8.59(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    12.35 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      306.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.230(Ac.)
Runoff from this stream =      8.316(CFS)
Time of concentration =   12.35 min.
Rainfall intensity =     3.004(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      310.000
```

```
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   647.000(Ft.)
Top (of initial area) elevation =  1719.900(Ft.)
Bottom (of initial area) elevation =  1580.000(Ft.)
Difference in elevation =   139.900(Ft.)
Slope =    0.21623  s(percent)=      21.62
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.586 min.
Rainfall intensity =      3.436(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.875
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.700
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  93.16
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      7.337(CFS)
Total initial stream area =        2.440(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      306.300
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =  1580.000(Ft.)
Downstream point elevation =  1535.000(Ft.)
Channel length thru subarea  =   532.000(Ft.)
Channel base width     =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =     11.272(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =     11.272(CFS)
Depth of flow =   0.864(Ft.), Average velocity =  15.084(Ft/s)
Channel flow top width =    1.729(Ft.)
Flow Velocity =   15.08(Ft/s)
Travel time  =    0.59 min.
Time of concentration =   10.17 min.

Sub-Channel No. 1 Critical depth =      1.508(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    4.958(Ft/s)
  '     '       '     Critical flow area =      2.273(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.871
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  92.20
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      3.330(In/Hr) for a   100.0 year storm
Subarea runoff =      7.797(CFS) for      2.690(Ac.)
Total runoff =     15.134(CFS)       Total area =       5.130(Ac.)
Depth of flow =   0.965(Ft.), Average velocity =  16.237(Ft/s)

Sub-Channel No. 1 Critical depth =      1.672(Ft.)
  '     '       '     Critical flow top width =      3.000(Ft.)
  '     '       '     Critical flow velocity=    5.472(Ft/s)
  '     '       '     Critical flow area =      2.766(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      306.300
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
```

```
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      5.130(Ac.)
Runoff from this stream =     15.134(CFS)
Time of concentration =   10.17 min.
Rainfall intensity =     3.330(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       13.877     11.08               3.182
2        8.316     12.35               3.004
3       15.134     10.17               3.330
Largest stream flow has longer or shorter time of concentration
Qp =     15.134 + sum of
          Qa          Tb/Ta
          13.877 *    0.918 =     12.738
          Qa          Tb/Ta
           8.316 *    0.824 =      6.848
Qp =     34.720

Total of 3 main streams to confluence:
Flow rates before confluence point:
      13.877       8.316      15.134
Area of streams before confluence:
        5.070        3.230        5.130


Results of confluence:
Total flow rate =     34.720(CFS)
Time of concentration =    10.174 min.
Effective stream area after confluence  =     13.430(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      306.300
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  93.10
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    10.17 min.
Rainfall intensity =      3.330(In/Hr) for a   100.0 year storm
Subarea runoff =      2.212(CFS) for      0.760(Ac.)
Total runoff =     36.932(CFS)       Total area =      14.190(Ac.)
End of computations, total study area =           14.19 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.708
Area averaged RI index number =  68.4
```

- Area 'C' – 2 Year - Pre-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 02/11/19 File: EXC00212.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	0.55	10.25

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	1.30	24.22

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 0.550(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 0.550(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      80.3  63.4      0.433     0.000        0.433       1.000      0.433
                                                        Sum (F) =   0.433
      Area averaged mean soil loss (F) (In/Hr) =  0.433
      Minimum soil loss rate ((In/Hr)) =  0.217
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.900
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5300
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                           Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083        162.871         36.151             6.788
          2   0.167        325.743         46.052             8.646
          3   0.250        488.614         10.486             1.969
          4   0.333        651.486          4.490             0.843
          5   0.417        814.357          2.821             0.530
                                   Sum = 100.000   Sum=      18.776
-------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max    |   Low        (In/Hr)
   1   0.08     3.40      0.224       (  0.433)       0.202        0.022
   2   0.17     4.70      0.310       (  0.433)       0.279        0.031
   3   0.25     4.70      0.310       (  0.433)       0.279        0.031
   4   0.33     5.10      0.337       (  0.433)       0.303        0.034
   5   0.42     5.80      0.383       (  0.433)       0.344        0.038
   6   0.50     5.90      0.389       (  0.433)       0.350        0.039
   7   0.58     7.10      0.469       (  0.433)       0.422        0.047
   8   0.67     8.70      0.574          0.433    (  0.517)        0.141
   9   0.75    13.20      0.871          0.433    (  0.784)        0.438
  10   0.83    29.70      1.960          0.433    (  1.764)        1.527
  11   0.92     7.70      0.508          0.433    (  0.457)        0.075
  12   1.00     4.00      0.264       (  0.433)       0.238        0.026
               (Loss Rate Not Used)
     Sum =     100.0                                  Sum =     2.4
       Flood volume = Effective rainfall      0.20(In)
        times area      18.6(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
       Total soil loss =      0.35(In)
       Total soil loss =     0.537(Ac.Ft)
       Total rainfall =      0.55(In)
       Flood volume =       13804.1 Cubic Feet
       Total soil loss =       23384.4 Cubic Feet
       ------------------------------------------------------------------------
        Peak flow rate of this hydrograph =     14.725(CFS)
       ------------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           1 - H O U R    S T O R M
                       R u n o f f     H y d r o g r a p h
       ------------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

       ------------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
  ----------------------------------------------------------------------
    0+ 5       0.0010      0.15  Q         |         |         |         |
    0+10       0.0038      0.40  Q         |         |         |         |
```

```
    0+15       0.0074      0.52  VQ        |         |         |         |
    0+20       0.0114      0.58  |Q        |         |         |         |
    0+25       0.0159      0.65  |QV       |         |         |         |
    0+30       0.0207      0.70  |QV       |         |         |         |
    0+35       0.0261      0.78  |Q V      |         |         |         |
    0+40       0.0363      1.49  | Q V     |         |         |         |
    0+45       0.0662      4.34  |       Q |         |         |         |
    0+50       0.1661     14.50  |         |         V       Q |         |
    0+55       0.2675     14.72  |         |         |        Q|  V      |
    1+ 0       0.2969      4.28  |       Q |         |         |      V  |
    1+ 5       0.3100      1.90  |  Q      |         |         |        V|
    1+10       0.3164      0.92  |Q        |         |         |        V|
    1+15       0.3168      0.06  Q         |         |         |        V|
    1+20       0.3169      0.01  Q         |         |         |        V|
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 02/11/19 File: EXC00232.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	0.85	15.84

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	2.00	37.26

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 0.850(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 0.850(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.3	63.4	0.433	0.000	0.433	1.000	0.433
					Sum (F) =	0.433

Area averaged mean soil loss (F) (In/Hr) = 0.433
Minimum soil loss rate ((In/Hr)) = 0.217
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	162.871	36.151	6.788
2	0.167	325.743	46.052	8.646
3	0.250	488.614	10.486	1.969
4	0.333	651.486	4.490	0.843
5	0.417	814.357	2.821	0.530
			Sum = 100.000	Sum= 18.776

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.133	(0.433)	0.119	0.013
2	0.17	1.30	0.133	(0.433)	0.119	0.013
3	0.25	1.10	0.112	(0.433)	0.101	0.011
4	0.33	1.50	0.153	(0.433)	0.138	0.015
5	0.42	1.50	0.153	(0.433)	0.138	0.015
6	0.50	1.80	0.184	(0.433)	0.165	0.018
7	0.58	1.50	0.153	(0.433)	0.138	0.015
8	0.67	1.80	0.184	(0.433)	0.165	0.018
9	0.75	1.80	0.184	(0.433)	0.165	0.018
10	0.83	1.50	0.153	(0.433)	0.138	0.015
11	0.92	1.60	0.163	(0.433)	0.147	0.016
12	1.00	1.80	0.184	(0.433)	0.165	0.018
13	1.08	2.20	0.224	(0.433)	0.202	0.022
14	1.17	2.20	0.224	(0.433)	0.202	0.022
15	1.25	2.20	0.224	(0.433)	0.202	0.022
16	1.33	2.00	0.204	(0.433)	0.184	0.020
17	1.42	2.60	0.265	(0.433)	0.239	0.027
18	1.50	2.70	0.275	(0.433)	0.248	0.028
19	1.58	2.40	0.245	(0.433)	0.220	0.024
20	1.67	2.70	0.275	(0.433)	0.248	0.028
21	1.75	3.30	0.337	(0.433)	0.303	0.034
22	1.83	3.10	0.316	(0.433)	0.285	0.032
23	1.92	2.90	0.296	(0.433)	0.266	0.030
24	2.00	3.00	0.306	(0.433)	0.275	0.031
25	2.08	3.10	0.316	(0.433)	0.285	0.032
26	2.17	4.20	0.428	(0.433)	0.386	0.043
27	2.25	5.00	0.510	0.433	(0.459)	0.077
28	2.33	3.50	0.357	(0.433)	0.321	0.036
29	2.42	6.80	0.694	0.433	(0.624)	0.260
30	2.50	7.30	0.745	0.433	(0.670)	0.311
31	2.58	8.20	0.836	0.433	(0.753)	0.403
32	2.67	5.90	0.602	0.433	(0.542)	0.169
33	2.75	2.00	0.204	(0.433)	0.184	0.020
34	2.83	1.80	0.184	(0.433)	0.165	0.018
35	2.92	1.80	0.184	(0.433)	0.165	0.018
36	3.00	0.60	0.061	(0.433)	0.055	0.006
		(Loss Rate Not Used)				

```
   Sum =     100.0                                    Sum =     1.9
      Flood volume = Effective rainfall      0.16(In)
       times area      18.6(Ac.)/[(In)/(Ft.)] =       0.2(Ac.Ft)
      Total soil loss =      0.69(In)
      Total soil loss =     1.073(Ac.Ft)
      Total rainfall =      0.85(In)
      Flood volume =       10719.5 Cubic Feet
      Total soil loss =       46758.7 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      6.017(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0006      0.09  Q         |         |         |         |
   0+10       0.0020      0.20  Q         |         |         |         |
   0+15       0.0035      0.22  Q         |         |         |         |
   0+20       0.0052      0.24  Q         |         |         |         |
   0+25       0.0071      0.28  |Q        |         |         |         |
   0+30       0.0092      0.30  |Q        |         |         |         |
   0+35       0.0113      0.31  |Q        |         |         |         |
   0+40       0.0135      0.31  |QV       |         |         |         |
   0+45       0.0158      0.34  |QV       |         |         |         |
   0+50       0.0180      0.32  |QV       |         |         |         |
   0+55       0.0201      0.30  |Q V      |         |         |         |
   1+ 0       0.0223      0.32  |Q V      |         |         |         |
   1+ 5       0.0248      0.37  |Q  V     |         |         |         |
   1+10       0.0276      0.40  |Q  V     |         |         |         |
   1+15       0.0305      0.41  |Q  V     |         |         |         |
   1+20       0.0333      0.41  |Q   V    |         |         |         |
   1+25       0.0362      0.43  |Q   V    |         |         |         |
   1+30       0.0396      0.49  |Q    V   |         |         |         |
   1+35       0.0429      0.49  |Q    V   |         |         |         |
   1+40       0.0463      0.49  |Q     V  |         |         |         |
   1+45       0.0501      0.55  | Q     V |         |         |         |
   1+50       0.0542      0.60  | Q     V |         |         |         |
   1+55       0.0582      0.58  | Q      V|         |         |         |
   2+ 0       0.0621      0.57  | Q       V         |         |         |
   2+ 5       0.0661      0.58  | Q       V         |         |         |
   2+10       0.0707      0.67  | Q       |V        |         |         |
   2+15       0.0775      1.00  |  Q      | V       |         |         |
   2+20       0.0847      1.03  |   Q     |  V      |         |         |
   2+25       0.1004      2.28  |         Q|     V   |         |         |
   2+30       0.1316      4.53  |          |       Q |V        |         |
   2+35       0.1730      6.02  |          |         |   Q   V |         |
   2+40       0.2108      5.49  |          |         |Q        |   V     |
   2+45       0.2300      2.79  |          |Q        |         |      V  |
   2+50       0.2379      1.14  |   Q      |         |         |       V |
   2+55       0.2425      0.68  | Q        |         |         |        V|
   3+ 0       0.2449      0.34  |Q         |         |         |        V|
   3+ 5       0.2457      0.12  Q          |         |         |        V|
   3+10       0.2460      0.04  Q          |         |         |        V|
   3+15       0.2461      0.01  Q          |         |         |        V|
   3+20       0.2461      0.00  Q          |         |         |         V
------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 02/11/19 File: EXC00262.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	1.20	22.36

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	3.00	55.89

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 1.200(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.200(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.3	63.4	0.433	0.000	0.433	1.000	0.433
					Sum (F) =	0.433

Area averaged mean soil loss (F) (In/Hr) = 0.433
Minimum soil loss rate ((In/Hr)) = 0.217
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

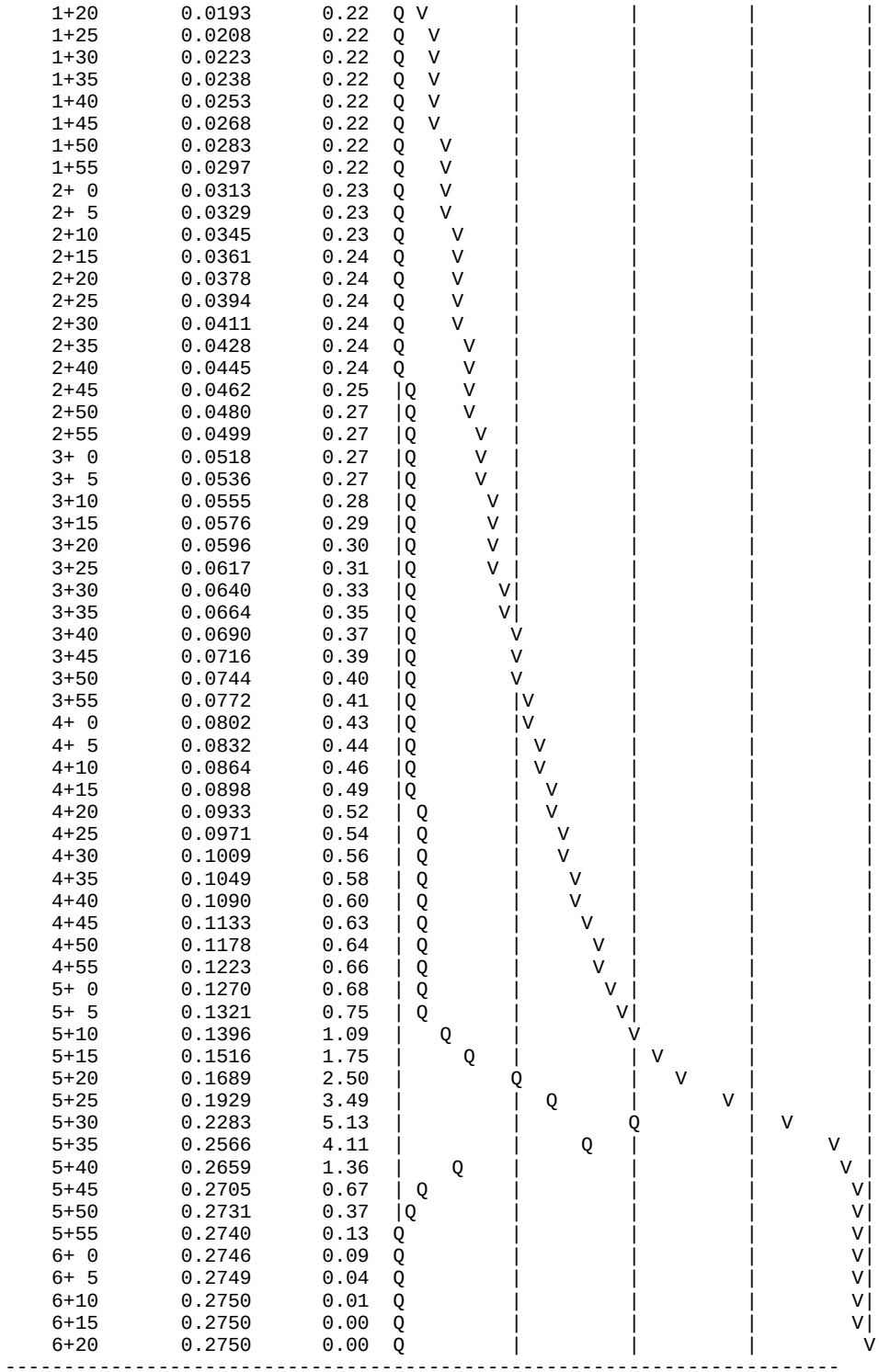
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	162.871	36.151	6.788
2	0.167	325.743	46.052	8.646
3	0.250	488.614	10.486	1.969
4	0.333	651.486	4.490	0.843
5	0.417	814.357	2.821	0.530
			Sum = 100.000	Sum= 18.776

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.072	(0.433)	0.065	0.007
2	0.17	0.60	0.086	(0.433)	0.078	0.009
3	0.25	0.60	0.086	(0.433)	0.078	0.009
4	0.33	0.60	0.086	(0.433)	0.078	0.009
5	0.42	0.60	0.086	(0.433)	0.078	0.009
6	0.50	0.70	0.101	(0.433)	0.091	0.010
7	0.58	0.70	0.101	(0.433)	0.091	0.010
8	0.67	0.70	0.101	(0.433)	0.091	0.010
9	0.75	0.70	0.101	(0.433)	0.091	0.010
10	0.83	0.70	0.101	(0.433)	0.091	0.010
11	0.92	0.70	0.101	(0.433)	0.091	0.010
12	1.00	0.80	0.115	(0.433)	0.104	0.012
13	1.08	0.80	0.115	(0.433)	0.104	0.012
14	1.17	0.80	0.115	(0.433)	0.104	0.012
15	1.25	0.80	0.115	(0.433)	0.104	0.012
16	1.33	0.80	0.115	(0.433)	0.104	0.012
17	1.42	0.80	0.115	(0.433)	0.104	0.012
18	1.50	0.80	0.115	(0.433)	0.104	0.012
19	1.58	0.80	0.115	(0.433)	0.104	0.012
20	1.67	0.80	0.115	(0.433)	0.104	0.012
21	1.75	0.80	0.115	(0.433)	0.104	0.012
22	1.83	0.80	0.115	(0.433)	0.104	0.012
23	1.92	0.80	0.115	(0.433)	0.104	0.012
24	2.00	0.90	0.130	(0.433)	0.117	0.013
25	2.08	0.80	0.115	(0.433)	0.104	0.012
26	2.17	0.90	0.130	(0.433)	0.117	0.013
27	2.25	0.90	0.130	(0.433)	0.117	0.013
28	2.33	0.90	0.130	(0.433)	0.117	0.013
29	2.42	0.90	0.130	(0.433)	0.117	0.013
30	2.50	0.90	0.130	(0.433)	0.117	0.013
31	2.58	0.90	0.130	(0.433)	0.117	0.013
32	2.67	0.90	0.130	(0.433)	0.117	0.013
33	2.75	1.00	0.144	(0.433)	0.130	0.014
34	2.83	1.00	0.144	(0.433)	0.130	0.014
35	2.92	1.00	0.144	(0.433)	0.130	0.014
36	3.00	1.00	0.144	(0.433)	0.130	0.014
37	3.08	1.00	0.144	(0.433)	0.130	0.014

```
38   3.17     1.10      0.158       (  0.433)       0.143        0.016
39   3.25     1.10      0.158       (  0.433)       0.143        0.016
40   3.33     1.10      0.158       (  0.433)       0.143        0.016
41   3.42     1.20      0.173       (  0.433)       0.156        0.017
42   3.50     1.30      0.187       (  0.433)       0.168        0.019
43   3.58     1.40      0.202       (  0.433)       0.181        0.020
44   3.67     1.40      0.202       (  0.433)       0.181        0.020
45   3.75     1.50      0.216       (  0.433)       0.194        0.022
46   3.83     1.50      0.216       (  0.433)       0.194        0.022
47   3.92     1.60      0.230       (  0.433)       0.207        0.023
48   4.00     1.60      0.230       (  0.433)       0.207        0.023
49   4.08     1.70      0.245       (  0.433)       0.220        0.024
50   4.17     1.80      0.259       (  0.433)       0.233        0.026
51   4.25     1.90      0.274       (  0.433)       0.246        0.027
52   4.33     2.00      0.288       (  0.433)       0.259        0.029
53   4.42     2.10      0.302       (  0.433)       0.272        0.030
54   4.50     2.10      0.302       (  0.433)       0.272        0.030
55   4.58     2.20      0.317       (  0.433)       0.285        0.032
56   4.67     2.30      0.331       (  0.433)       0.298        0.033
57   4.75     2.40      0.346       (  0.433)       0.311        0.035
58   4.83     2.40      0.346       (  0.433)       0.311        0.035
59   4.92     2.50      0.360       (  0.433)       0.324        0.036
60   5.00     2.60      0.374       (  0.433)       0.337        0.037
61   5.08     3.10      0.446       (  0.433)       0.402        0.045
62   5.17     3.60      0.518          0.433    (  0.467)        0.085
63   5.25     3.90      0.562          0.433    (  0.505)        0.129
64   5.33     4.20      0.605          0.433    (  0.544)        0.172
65   5.42     4.70      0.677          0.433    (  0.609)        0.244
66   5.50     5.60      0.806          0.433    (  0.726)        0.373
67   5.58     1.90      0.274       (  0.433)       0.246        0.027
68   5.67     0.90      0.130       (  0.433)       0.117        0.013
69   5.75     0.60      0.086       (  0.433)       0.078        0.009
70   5.83     0.50      0.072       (  0.433)       0.065        0.007
71   5.92     0.30      0.043       (  0.433)       0.039        0.004
72   6.00     0.20      0.029       (  0.433)       0.026        0.003
              (Loss Rate Not Used)
   Sum =     100.0                                    Sum =     2.1
     Flood volume = Effective rainfall      0.18(In)
      times area      18.6(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
     Total soil loss =      1.02(In)
     Total soil loss =     1.588(Ac.Ft)
     Total rainfall =      1.20(In)
     Flood volume =       11979.0 Cubic Feet
     Total soil loss =       69168.1 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      5.135(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         6 - H O U R    S T O R M
                    R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------------
  0+ 5       0.0003      0.05  Q         |         |         |         |
  0+10       0.0012      0.12  Q         |         |         |         |
  0+15       0.0022      0.15  Q         |         |         |         |
  0+20       0.0033      0.16  Q         |         |         |         |
  0+25       0.0044      0.16  Q         |         |         |         |
  0+30       0.0056      0.17  Q         |         |         |         |
  0+35       0.0068      0.18  Q         |         |         |         |
  0+40       0.0081      0.19  QV        |         |         |         |
  0+45       0.0094      0.19  QV        |         |         |         |
  0+50       0.0107      0.19  QV        |         |         |         |
  0+55       0.0120      0.19  QV        |         |         |         |
  1+ 0       0.0134      0.20  QV        |         |         |         |
  1+ 5       0.0149      0.21  Q V       |         |         |         |
  1+10       0.0163      0.21  Q V       |         |         |         |
  1+15       0.0178      0.22  Q V       |         |         |         |
```



U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: EXC002242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR HOUR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	2.00	37.26

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	5.00	93.15

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.3	63.4	0.433	0.000	0.433	1.000	0.433
					Sum (F) =	0.433

Area averaged mean soil loss (F) (In/Hr) = 0.433
Minimum soil loss rate ((In/Hr)) = 0.217
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	488.614	70.347	13.208
2	0.500	977.229	29.653	5.567
		Sum = 100.000	Sum=	18.776

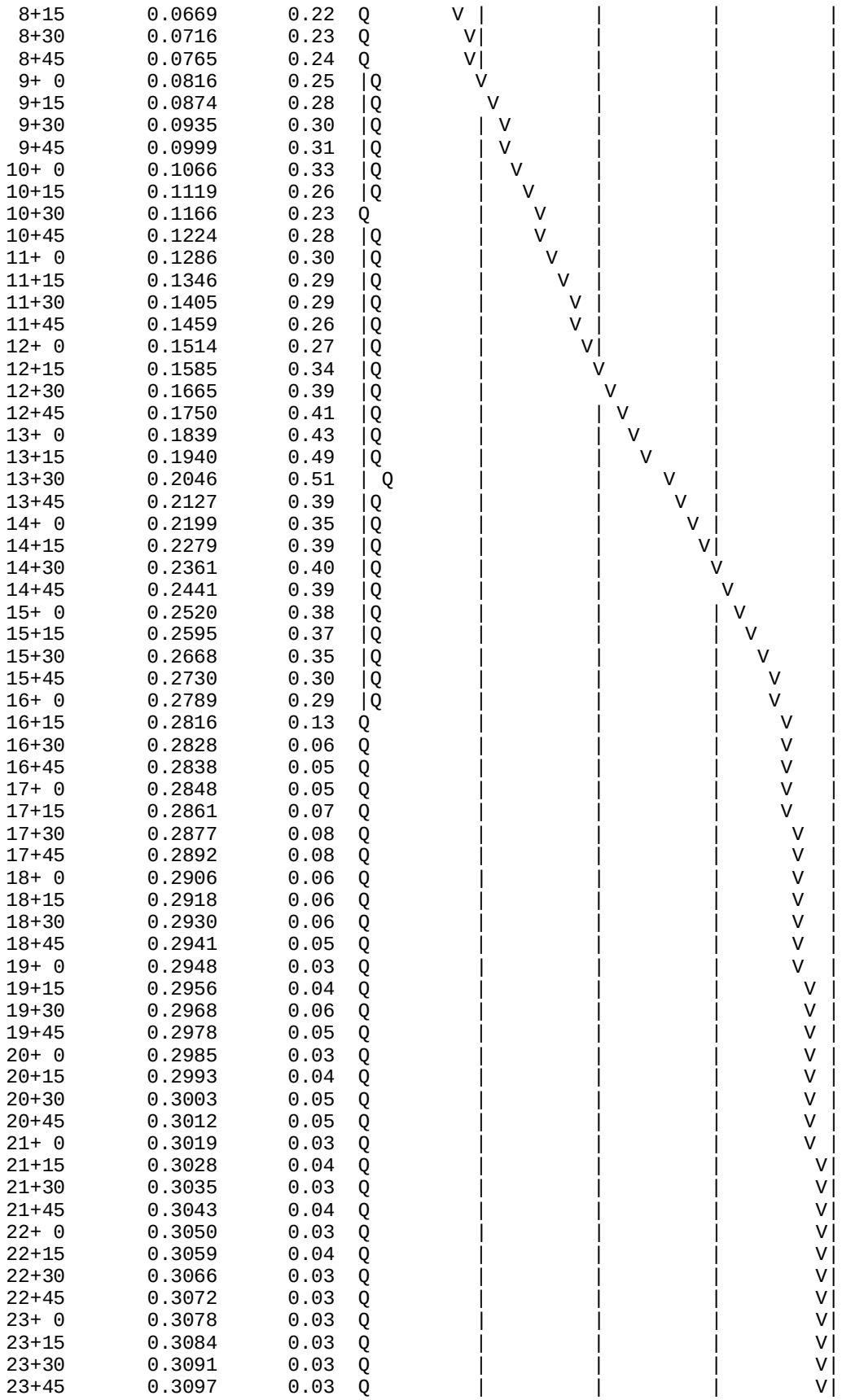
The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.016	(0.765)	0.014	0.002
2	0.50	0.30	0.024	(0.756)	0.022	0.002
3	0.75	0.30	0.024	(0.747)	0.022	0.002
4	1.00	0.40	0.032	(0.738)	0.029	0.003
5	1.25	0.30	0.024	(0.730)	0.022	0.002
6	1.50	0.30	0.024	(0.721)	0.022	0.002
7	1.75	0.30	0.024	(0.712)	0.022	0.002
8	2.00	0.40	0.032	(0.704)	0.029	0.003
9	2.25	0.40	0.032	(0.695)	0.029	0.003
10	2.50	0.40	0.032	(0.687)	0.029	0.003
11	2.75	0.50	0.040	(0.678)	0.036	0.004
12	3.00	0.50	0.040	(0.670)	0.036	0.004
13	3.25	0.50	0.040	(0.662)	0.036	0.004
14	3.50	0.50	0.040	(0.653)	0.036	0.004
15	3.75	0.50	0.040	(0.645)	0.036	0.004
16	4.00	0.60	0.048	(0.637)	0.043	0.005
17	4.25	0.60	0.048	(0.629)	0.043	0.005
18	4.50	0.70	0.056	(0.621)	0.050	0.006
19	4.75	0.70	0.056	(0.613)	0.050	0.006
20	5.00	0.80	0.064	(0.605)	0.058	0.006
21	5.25	0.60	0.048	(0.597)	0.043	0.005
22	5.50	0.70	0.056	(0.590)	0.050	0.006
23	5.75	0.80	0.064	(0.582)	0.058	0.006

24	6.00	0.80	0.064	(0.574)	0.058	0.006
25	6.25	0.90	0.072	(0.567)	0.065	0.007
26	6.50	0.90	0.072	(0.559)	0.065	0.007
27	6.75	1.00	0.080	(0.552)	0.072	0.008
28	7.00	1.00	0.080	(0.544)	0.072	0.008
29	7.25	1.00	0.080	(0.537)	0.072	0.008
30	7.50	1.10	0.088	(0.529)	0.079	0.009
31	7.75	1.20	0.096	(0.522)	0.086	0.010
32	8.00	1.30	0.104	(0.515)	0.094	0.010
33	8.25	1.50	0.120	(0.508)	0.108	0.012
34	8.50	1.50	0.120	(0.501)	0.108	0.012
35	8.75	1.60	0.128	(0.494)	0.115	0.013
36	9.00	1.70	0.136	(0.487)	0.122	0.014
37	9.25	1.90	0.152	(0.480)	0.137	0.015
38	9.50	2.00	0.160	(0.473)	0.144	0.016
39	9.75	2.10	0.168	(0.466)	0.151	0.017
40	10.00	2.20	0.176	(0.460)	0.158	0.018
41	10.25	1.50	0.120	(0.453)	0.108	0.012
42	10.50	1.50	0.120	(0.446)	0.108	0.012
43	10.75	2.00	0.160	(0.440)	0.144	0.016
44	11.00	2.00	0.160	(0.433)	0.144	0.016
45	11.25	1.90	0.152	(0.427)	0.137	0.015
46	11.50	1.90	0.152	(0.421)	0.137	0.015
47	11.75	1.70	0.136	(0.414)	0.122	0.014
48	12.00	1.80	0.144	(0.408)	0.130	0.014
49	12.25	2.50	0.200	(0.402)	0.180	0.020
50	12.50	2.60	0.208	(0.396)	0.187	0.021
51	12.75	2.80	0.224	(0.390)	0.202	0.022
52	13.00	2.90	0.232	(0.384)	0.209	0.023
53	13.25	3.40	0.272	(0.379)	0.245	0.027
54	13.50	3.40	0.272	(0.373)	0.245	0.027
55	13.75	2.30	0.184	(0.367)	0.166	0.018
56	14.00	2.30	0.184	(0.362)	0.166	0.018
57	14.25	2.70	0.216	(0.356)	0.194	0.022
58	14.50	2.60	0.208	(0.351)	0.187	0.021
59	14.75	2.60	0.208	(0.345)	0.187	0.021
60	15.00	2.50	0.200	(0.340)	0.180	0.020
61	15.25	2.40	0.192	(0.335)	0.173	0.019
62	15.50	2.30	0.184	(0.330)	0.166	0.018
63	15.75	1.90	0.152	(0.325)	0.137	0.015
64	16.00	1.90	0.152	(0.320)	0.137	0.015
65	16.25	0.40	0.032	(0.315)	0.029	0.003
66	16.50	0.40	0.032	(0.310)	0.029	0.003
67	16.75	0.30	0.024	(0.305)	0.022	0.002
68	17.00	0.30	0.024	(0.301)	0.022	0.002
69	17.25	0.50	0.040	(0.296)	0.036	0.004
70	17.50	0.50	0.040	(0.292)	0.036	0.004
71	17.75	0.50	0.040	(0.287)	0.036	0.004
72	18.00	0.40	0.032	(0.283)	0.029	0.003
73	18.25	0.40	0.032	(0.279)	0.029	0.003
74	18.50	0.40	0.032	(0.275)	0.029	0.003
75	18.75	0.30	0.024	(0.271)	0.022	0.002
76	19.00	0.20	0.016	(0.267)	0.014	0.002
77	19.25	0.30	0.024	(0.263)	0.022	0.002
78	19.50	0.40	0.032	(0.260)	0.029	0.003
79	19.75	0.30	0.024	(0.256)	0.022	0.002
80	20.00	0.20	0.016	(0.253)	0.014	0.002
81	20.25	0.30	0.024	(0.249)	0.022	0.002
82	20.50	0.30	0.024	(0.246)	0.022	0.002
83	20.75	0.30	0.024	(0.243)	0.022	0.002
84	21.00	0.20	0.016	(0.240)	0.014	0.002
85	21.25	0.30	0.024	(0.237)	0.022	0.002
86	21.50	0.20	0.016	(0.234)	0.014	0.002

```
87  21.75     0.30      0.024       (  0.232)       0.022        0.002
88  22.00     0.20      0.016       (  0.229)       0.014        0.002
89  22.25     0.30      0.024       (  0.227)       0.022        0.002
90  22.50     0.20      0.016       (  0.225)       0.014        0.002
91  22.75     0.20      0.016       (  0.223)       0.014        0.002
92  23.00     0.20      0.016       (  0.221)       0.014        0.002
93  23.25     0.20      0.016       (  0.220)       0.014        0.002
94  23.50     0.20      0.016       (  0.218)       0.014        0.002
95  23.75     0.20      0.016       (  0.217)       0.014        0.002
96  24.00     0.20      0.016       (  0.217)       0.014        0.002
            (Loss Rate Not Used)
   Sum =     100.0                                   Sum =     0.8
    Flood volume = Effective rainfall      0.20(In)
     times area      18.6(Ac.)/[(In)/(Ft.)] =       0.3(Ac.Ft)
    Total soil loss =      1.80(In)
    Total soil loss =     2.794(Ac.Ft)
    Total rainfall =      2.00(In)
    Flood volume =       13524.9 Cubic Feet
    Total soil loss =      121724.0 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =      0.511(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        24 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in  15   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------------
  0+15       0.0004      0.02  Q         |         |         |         |
  0+30       0.0013      0.04  Q         |         |         |         |
  0+45       0.0022      0.05  Q         |         |         |         |
  1+ 0       0.0034      0.06  Q         |         |         |         |
  1+15       0.0044      0.05  Q         |         |         |         |
  1+30       0.0053      0.05  Q         |         |         |         |
  1+45       0.0062      0.05  Q         |         |         |         |
  2+ 0       0.0074      0.06  Q         |         |         |         |
  2+15       0.0086      0.06  QV        |         |         |         |
  2+30       0.0099      0.06  QV        |         |         |         |
  2+45       0.0113      0.07  QV        |         |         |         |
  3+ 0       0.0129      0.08  QV        |         |         |         |
  3+15       0.0144      0.08  QV        |         |         |         |
  3+30       0.0160      0.08  Q V       |         |         |         |
  3+45       0.0175      0.08  Q V       |         |         |         |
  4+ 0       0.0193      0.09  Q V       |         |         |         |
  4+15       0.0212      0.09  Q V       |         |         |         |
  4+30       0.0233      0.10  Q V       |         |         |         |
  4+45       0.0254      0.11  Q  V      |         |         |         |
  5+ 0       0.0278      0.12  Q  V      |         |         |         |
  5+15       0.0299      0.10  Q  V      |         |         |         |
  5+30       0.0320      0.10  Q   V     |         |         |         |
  5+45       0.0343      0.12  Q   V     |         |         |         |
  6+ 0       0.0368      0.12  Q   V     |         |         |         |
  6+15       0.0395      0.13  Q    V    |         |         |         |
  6+30       0.0423      0.14  Q    V    |         |         |         |
  6+45       0.0453      0.15  Q    V    |         |         |         |
  7+ 0       0.0484      0.15  Q     V   |         |         |         |
  7+15       0.0516      0.15  Q     V   |         |         |         |
  7+30       0.0549      0.16  Q      V  |         |         |         |
  7+45       0.0585      0.18  Q      V  |         |         |         |
  8+ 0       0.0625      0.19  Q       V |         |         |         |
```



```
   24+ 0       0.3103      0.03  Q         |         |         |        V|
   24+15       0.3105      0.01  Q         |         |         |         V
-------------------------------------------------------------------------
```

- Area 'C' – 10 Year - Pre-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 02/11/19 File: EXC010110.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	0.55	10.25

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	1.30	24.22

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 0.859(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 0.858(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

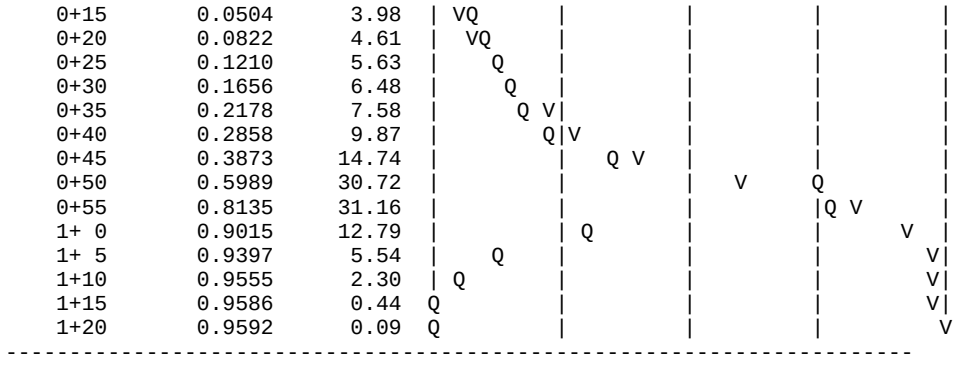
```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      80.3  80.3      0.241     0.000        0.241       1.000      0.241
                                                        Sum (F) =   0.241
      Area averaged mean soil loss (F) (In/Hr) =  0.241
      Minimum soil loss rate ((In/Hr)) =  0.120
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.900
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5300
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                           Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083        162.871         36.151             6.788
          2   0.167        325.743         46.052             8.646
          3   0.250        488.614         10.486             1.969
          4   0.333        651.486          4.490             0.843
          5   0.417        814.357          2.821             0.530
                                  Sum = 100.000   Sum=      18.776
-------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max    |   Low        (In/Hr)
   1   0.08     3.40      0.350          0.241    (  0.315)        0.110
   2   0.17     4.70      0.484          0.241    (  0.436)        0.244
   3   0.25     4.70      0.484          0.241    (  0.436)        0.244
   4   0.33     5.10      0.525          0.241    (  0.473)        0.285
   5   0.42     5.80      0.597          0.241    (  0.538)        0.357
   6   0.50     5.90      0.608          0.241    (  0.547)        0.367
   7   0.58     7.10      0.731          0.241    (  0.658)        0.491
   8   0.67     8.70      0.896          0.241    (  0.807)        0.656
   9   0.75    13.20      1.360          0.241    (  1.224)        1.119
  10   0.83    29.70      3.059          0.241    (  2.753)        2.819
  11   0.92     7.70      0.793          0.241    (  0.714)        0.553
  12   1.00     4.00      0.412          0.241    (  0.371)        0.171
               (Loss Rate Not Used)
     Sum =     100.0                                 Sum =     7.4
       Flood volume = Effective rainfall      0.62(In)
        times area      18.6(Ac.)/[(In)/(Ft.)] =       1.0(Ac.Ft)
       Total soil loss =      0.24(In)
       Total soil loss =     0.374(Ac.Ft)
       Total rainfall =      0.86(In)
       Flood volume =       41782.0 Cubic Feet
       Total soil loss =       16269.7 Cubic Feet
       ------------------------------------------------------------------------
        Peak flow rate of this hydrograph =     31.156(CFS)
       ------------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
       ------------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

       ------------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
  ----------------------------------------------------------------------
    0+ 5       0.0051      0.74  Q         |         |         |         |
    0+10       0.0231      2.60  V Q       |         |         |         |
```


0+15 0.0504 3.98
0+20 0.0822 4.61
0+25 0.1210 5.63
0+30 0.1656 6.48
0+35 0.2178 7.58
0+40 0.2858 9.87
0+45 0.3873 14.74
0+50 0.5989 30.72
0+55 0.8135 31.16
1+ 0 0.9015 12.79
1+ 5 0.9397 5.54
1+10 0.9555 2.30
1+15 0.9586 0.44
1+20 0.9592 0.09

U n i t H y d r o g r a p h A n a l y s i s

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Study date 02/11/19 File: EXC010310.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	0.85	15.84

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	2.00	37.26

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 1.323(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.323(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.3	80.3	0.241	0.000	0.241	1.000	0.241
					Sum (F) =	0.241

Area averaged mean soil loss (F) (In/Hr) = 0.241
Minimum soil loss rate ((In/Hr)) = 0.120
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	162.871	36.151	6.788
2	0.167	325.743	46.052	8.646
3	0.250	488.614	10.486	1.969
4	0.333	651.486	4.490	0.843
5	0.417	814.357	2.821	0.530
			Sum = 100.000	Sum= 18.776

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.206	(0.241)	0.186	0.021
2	0.17	1.30	0.206	(0.241)	0.186	0.021
3	0.25	1.10	0.175	(0.241)	0.157	0.017
4	0.33	1.50	0.238	(0.241)	0.214	0.024
5	0.42	1.50	0.238	(0.241)	0.214	0.024
6	0.50	1.80	0.286	0.241	(0.257)	0.045
7	0.58	1.50	0.238	(0.241)	0.214	0.024
8	0.67	1.80	0.286	0.241	(0.257)	0.045
9	0.75	1.80	0.286	0.241	(0.257)	0.045
10	0.83	1.50	0.238	(0.241)	0.214	0.024
11	0.92	1.60	0.254	(0.241)	0.229	0.025
12	1.00	1.80	0.286	0.241	(0.257)	0.045
13	1.08	2.20	0.349	0.241	(0.314)	0.109
14	1.17	2.20	0.349	0.241	(0.314)	0.109
15	1.25	2.20	0.349	0.241	(0.314)	0.109
16	1.33	2.00	0.318	0.241	(0.286)	0.077
17	1.42	2.60	0.413	0.241	(0.372)	0.172
18	1.50	2.70	0.429	0.241	(0.386)	0.188
19	1.58	2.40	0.381	0.241	(0.343)	0.140
20	1.67	2.70	0.429	0.241	(0.386)	0.188
21	1.75	3.30	0.524	0.241	(0.472)	0.283
22	1.83	3.10	0.492	0.241	(0.443)	0.252
23	1.92	2.90	0.460	0.241	(0.414)	0.220
24	2.00	3.00	0.476	0.241	(0.429)	0.236
25	2.08	3.10	0.492	0.241	(0.443)	0.252
26	2.17	4.20	0.667	0.241	(0.600)	0.426
27	2.25	5.00	0.794	0.241	(0.714)	0.553
28	2.33	3.50	0.556	0.241	(0.500)	0.315
29	2.42	6.80	1.080	0.241	(0.972)	0.839
30	2.50	7.30	1.159	0.241	(1.043)	0.918
31	2.58	8.20	1.302	0.241	(1.172)	1.061
32	2.67	5.90	0.937	0.241	(0.843)	0.696
33	2.75	2.00	0.318	0.241	(0.286)	0.077
34	2.83	1.80	0.286	0.241	(0.257)	0.045
35	2.92	1.80	0.286	0.241	(0.257)	0.045
36	3.00	0.60	0.095	(0.241)	0.086	0.010
		(Loss Rate Not Used)				

```
   Sum =     100.0                                    Sum =     7.7
      Flood volume = Effective rainfall      0.64(In)
       times area      18.6(Ac.)/[(In)/(Ft.)] =       1.0(Ac.Ft)
      Total soil loss =      0.68(In)
      Total soil loss =     1.060(Ac.Ft)
      Total rainfall =      1.32(In)
      Flood volume =       43282.0 Cubic Feet
      Total soil loss =       46189.1 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     17.364(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
 ------------------------------------------------------------------------
   0+ 5       0.0010      0.14  Q         |         |         |         |
   0+10       0.0032      0.32  Q         |         |         |         |
   0+15       0.0055      0.34  Q         |         |         |         |
   0+20       0.0080      0.37  Q         |         |         |         |
   0+25       0.0110      0.43  Q         |         |         |         |
   0+30       0.0150      0.59  VQ        |         |         |         |
   0+35       0.0194      0.63  VQ        |         |         |         |
   0+40       0.0237      0.63  VQ        |         |         |         |
   0+45       0.0292      0.80  |Q        |         |         |         |
   0+50       0.0339      0.69  |Q        |         |         |         |
   0+55       0.0375      0.52  |Q        |         |         |         |
   1+ 0       0.0419      0.64  |Q        |         |         |         |
   1+ 5       0.0503      1.22  | Q       |         |         |         |
   1+10       0.0627      1.80  | VQ      |         |         |         |
   1+15       0.0761      1.94  |  Q      |         |         |         |
   1+20       0.0885      1.79  |  Q      |         |         |         |
   1+25       0.1036      2.20  |   Q     |         |         |         |
   1+30       0.1247      3.07  |    VQ   |         |         |         |
   1+35       0.1457      3.04  |    VQ   |         |         |         |
   1+40       0.1667      3.05  |     Q   |         |         |         |
   1+45       0.1948      4.08  |      VQ |         |         |         |
   1+50       0.2275      4.75  |        Q|         |         |         |
   1+55       0.2582      4.46  |       Q V         |         |         |
   2+ 0       0.2880      4.34  |       Q |V        |         |         |
   2+ 5       0.3193      4.54  |        Q| V       |         |         |
   2+10       0.3596      5.85  |         |Q  V     |         |         |
   2+15       0.4165      8.26  |         |     Q   |         |         |
   2+20       0.4723      8.10  |         |     Q  V|         |         |
   2+25       0.5412     10.01  |         |         QV        |         |
   2+30       0.6432     14.81  |         |         |    V   Q|         |
   2+35       0.7628     17.36  |         |         |         V   Q     |
   2+40       0.8771     16.59  |         |         |         |  Q V    |
   2+45       0.9449      9.85  |         |         Q|        |       V |
   2+50       0.9706      3.73  |      Q  |         |         |        V|
   2+55       0.9843      2.00  |  Q      |         |         |        V|
   3+ 0       0.9911      0.98  |Q        |         |         |        V|
   3+ 5       0.9928      0.25  Q         |         |         |        V|
   3+10       0.9934      0.08  Q         |         |         |        V|
   3+15       0.9936      0.03  Q         |         |         |        V|
   3+20       0.9936      0.01  Q         |         |         |         V
------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 02/11/19 File: EXC010610.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	1.20	22.36

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	3.00	55.89

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 1.941(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.940(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.3	80.3	0.241	0.000	0.241	1.000	0.241
					Sum (F) =	0.241

Area averaged mean soil loss (F) (In/Hr) = 0.241
Minimum soil loss rate ((In/Hr)) = 0.120
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	162.871	36.151	6.788
2	0.167	325.743	46.052	8.646
3	0.250	488.614	10.486	1.969
4	0.333	651.486	4.490	0.843
5	0.417	814.357	2.821	0.530
			Sum = 100.000	Sum= 18.776

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.116	(0.241)	0.105	0.012
2	0.17	0.60	0.140	(0.241)	0.126	0.014
3	0.25	0.60	0.140	(0.241)	0.126	0.014
4	0.33	0.60	0.140	(0.241)	0.126	0.014
5	0.42	0.60	0.140	(0.241)	0.126	0.014
6	0.50	0.70	0.163	(0.241)	0.147	0.016
7	0.58	0.70	0.163	(0.241)	0.147	0.016
8	0.67	0.70	0.163	(0.241)	0.147	0.016
9	0.75	0.70	0.163	(0.241)	0.147	0.016
10	0.83	0.70	0.163	(0.241)	0.147	0.016
11	0.92	0.70	0.163	(0.241)	0.147	0.016
12	1.00	0.80	0.186	(0.241)	0.168	0.019
13	1.08	0.80	0.186	(0.241)	0.168	0.019
14	1.17	0.80	0.186	(0.241)	0.168	0.019
15	1.25	0.80	0.186	(0.241)	0.168	0.019
16	1.33	0.80	0.186	(0.241)	0.168	0.019
17	1.42	0.80	0.186	(0.241)	0.168	0.019
18	1.50	0.80	0.186	(0.241)	0.168	0.019
19	1.58	0.80	0.186	(0.241)	0.168	0.019
20	1.67	0.80	0.186	(0.241)	0.168	0.019
21	1.75	0.80	0.186	(0.241)	0.168	0.019
22	1.83	0.80	0.186	(0.241)	0.168	0.019
23	1.92	0.80	0.186	(0.241)	0.168	0.019
24	2.00	0.90	0.210	(0.241)	0.189	0.021
25	2.08	0.80	0.186	(0.241)	0.168	0.019
26	2.17	0.90	0.210	(0.241)	0.189	0.021
27	2.25	0.90	0.210	(0.241)	0.189	0.021
28	2.33	0.90	0.210	(0.241)	0.189	0.021
29	2.42	0.90	0.210	(0.241)	0.189	0.021
30	2.50	0.90	0.210	(0.241)	0.189	0.021
31	2.58	0.90	0.210	(0.241)	0.189	0.021
32	2.67	0.90	0.210	(0.241)	0.189	0.021
33	2.75	1.00	0.233	(0.241)	0.210	0.023
34	2.83	1.00	0.233	(0.241)	0.210	0.023
35	2.92	1.00	0.233	(0.241)	0.210	0.023
36	3.00	1.00	0.233	(0.241)	0.210	0.023
37	3.08	1.00	0.233	(0.241)	0.210	0.023

38	3.17	1.10	0.256	(0.241)	0.231	0.026
39	3.25	1.10	0.256	(0.241)	0.231	0.026
40	3.33	1.10	0.256	(0.241)	0.231	0.026
41	3.42	1.20	0.279	0.241	(0.251)	0.039
42	3.50	1.30	0.303	0.241	(0.272)	0.062
43	3.58	1.40	0.326	0.241	(0.293)	0.085
44	3.67	1.40	0.326	0.241	(0.293)	0.085
45	3.75	1.50	0.349	0.241	(0.314)	0.109
46	3.83	1.50	0.349	0.241	(0.314)	0.109
47	3.92	1.60	0.373	0.241	(0.335)	0.132
48	4.00	1.60	0.373	0.241	(0.335)	0.132
49	4.08	1.70	0.396	0.241	(0.356)	0.155
50	4.17	1.80	0.419	0.241	(0.377)	0.179
51	4.25	1.90	0.442	0.241	(0.398)	0.202
52	4.33	2.00	0.466	0.241	(0.419)	0.225
53	4.42	2.10	0.489	0.241	(0.440)	0.248
54	4.50	2.10	0.489	0.241	(0.440)	0.248
55	4.58	2.20	0.512	0.241	(0.461)	0.272
56	4.67	2.30	0.536	0.241	(0.482)	0.295
57	4.75	2.40	0.559	0.241	(0.503)	0.318
58	4.83	2.40	0.559	0.241	(0.503)	0.318
59	4.92	2.50	0.582	0.241	(0.524)	0.342
60	5.00	2.60	0.605	0.241	(0.545)	0.365
61	5.08	3.10	0.722	0.241	(0.650)	0.481
62	5.17	3.60	0.838	0.241	(0.754)	0.598
63	5.25	3.90	0.908	0.241	(0.817)	0.668
64	5.33	4.20	0.978	0.241	(0.880)	0.737
65	5.42	4.70	1.094	0.241	(0.985)	0.854
66	5.50	5.60	1.304	0.241	(1.174)	1.063
67	5.58	1.90	0.442	0.241	(0.398)	0.202
68	5.67	0.90	0.210	(0.241)	0.189	0.021
69	5.75	0.60	0.140	(0.241)	0.126	0.014
70	5.83	0.50	0.116	(0.241)	0.105	0.012
71	5.92	0.30	0.070	(0.241)	0.063	0.007
72	6.00	0.20	0.047	(0.241)	0.042	0.005

(Loss Rate Not Used)

Sum = 100.0 Sum = 9.3

Flood volume = Effective rainfall 0.78(In)
times area 18.6(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)
Total soil loss = 1.16(In)
Total soil loss = 1.803(Ac.Ft)
Total rainfall = 1.94(In)
Flood volume = 52691.1 Cubic Feet
Total soil loss = 78532.8 Cubic Feet

Peak flow rate of this hydrograph = 16.940(CFS)

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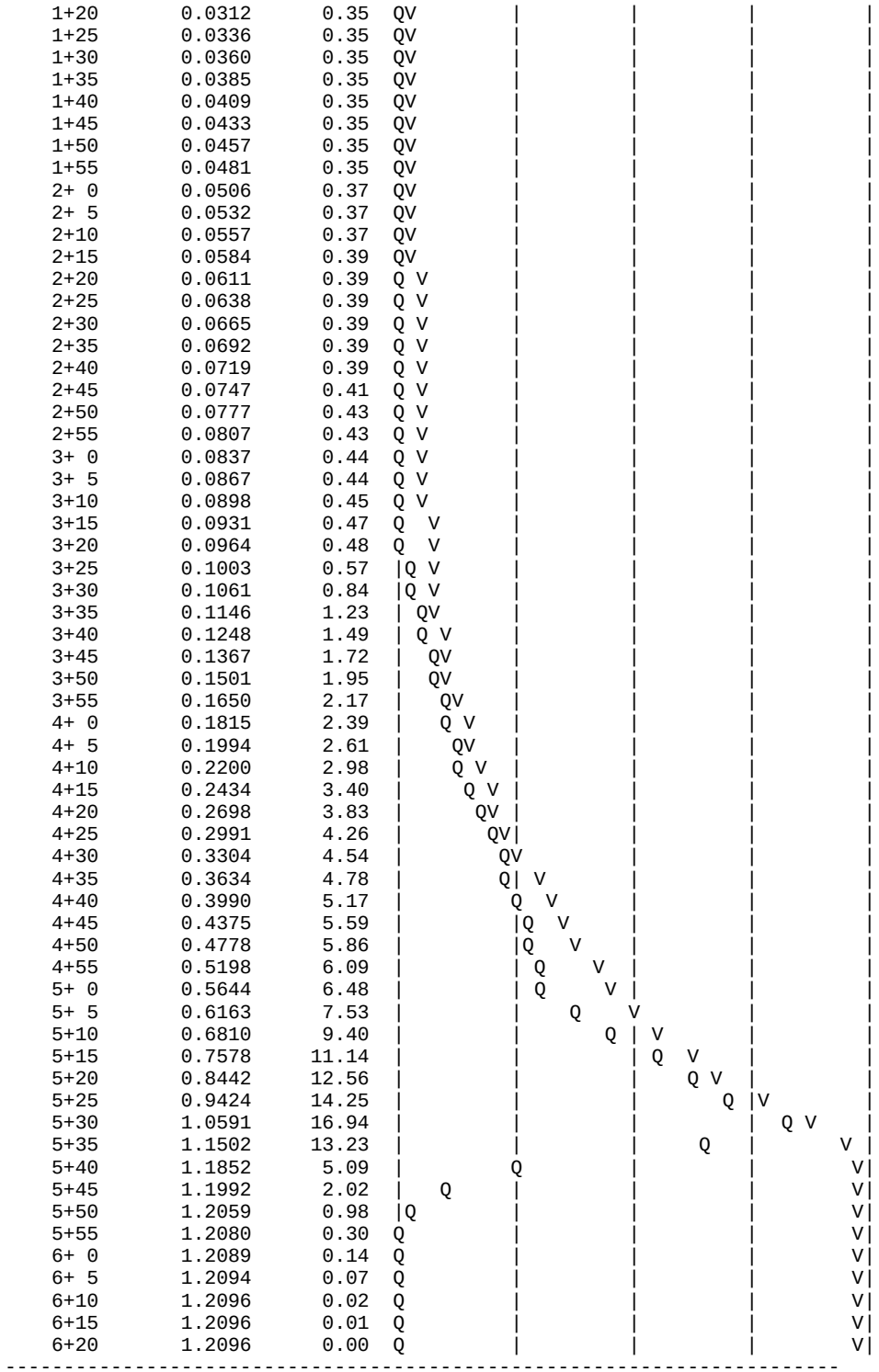
6 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	5.0	10.0	15.0	20.0
0+ 5	0.0005	0.08	Q	|	|	|	|
0+10	0.0019	0.20	Q	|	|	|	|
0+15	0.0035	0.24	Q	|	|	|	|
0+20	0.0053	0.25	Q	|	|	|	|
0+25	0.0071	0.26	Q	|	|	|	|
0+30	0.0090	0.28	Q	|	|	|	|
0+35	0.0110	0.30	Q	|	|	|	|
0+40	0.0131	0.30	Q	|	|	|	|
0+45	0.0152	0.30	Q	|	|	|	|
0+50	0.0173	0.31	Q	|	|	|	|
0+55	0.0195	0.31	Q	|	|	|	|
1+ 0	0.0217	0.32	Q	|	|	|	|
1+ 5	0.0240	0.34	Q	|	|	|	|
1+10	0.0264	0.35	Q	|	|	|	|
1+15	0.0288	0.35	Q	|	|	|	|



U n i t H y d r o g r a p h A n a l y s i s

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

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TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'C'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR HOUR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	2.00	37.26

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	5.00	93.15

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 3.234(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 3.234(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.3	80.3	0.241	0.000	0.241	1.000	0.241
					Sum (F) =	0.241

Area averaged mean soil loss (F) (In/Hr) = 0.241
Minimum soil loss rate ((In/Hr)) = 0.120
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	488.614	70.347	13.208
2	0.500	977.229	29.653	5.567
			Sum = 100.000 Sum=	18.776

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.25	0.20	0.026	(0.425)		0.023	0.003
2	0.50	0.30	0.039	(0.420)		0.035	0.004
3	0.75	0.30	0.039	(0.415)		0.035	0.004
4	1.00	0.40	0.052	(0.410)		0.047	0.005
5	1.25	0.30	0.039	(0.405)		0.035	0.004
6	1.50	0.30	0.039	(0.400)		0.035	0.004
7	1.75	0.30	0.039	(0.396)		0.035	0.004
8	2.00	0.40	0.052	(0.391)		0.047	0.005
9	2.25	0.40	0.052	(0.386)		0.047	0.005
10	2.50	0.40	0.052	(0.382)		0.047	0.005
11	2.75	0.50	0.065	(0.377)		0.058	0.006
12	3.00	0.50	0.065	(0.372)		0.058	0.006
13	3.25	0.50	0.065	(0.368)		0.058	0.006
14	3.50	0.50	0.065	(0.363)		0.058	0.006
15	3.75	0.50	0.065	(0.358)		0.058	0.006
16	4.00	0.60	0.078	(0.354)		0.070	0.008
17	4.25	0.60	0.078	(0.349)		0.070	0.008
18	4.50	0.70	0.091	(0.345)		0.081	0.009
19	4.75	0.70	0.091	(0.341)		0.081	0.009
20	5.00	0.80	0.103	(0.336)		0.093	0.010
21	5.25	0.60	0.078	(0.332)		0.070	0.008
22	5.50	0.70	0.091	(0.328)		0.081	0.009
23	5.75	0.80	0.103	(0.323)		0.093	0.010
24	6.00	0.80	0.103	(0.319)		0.093	0.010
25	6.25	0.90	0.116	(0.315)		0.105	0.012
26	6.50	0.90	0.116	(0.311)		0.105	0.012
27	6.75	1.00	0.129	(0.306)		0.116	0.013
28	7.00	1.00	0.129	(0.302)		0.116	0.013
29	7.25	1.00	0.129	(0.298)		0.116	0.013
30	7.50	1.10	0.142	(0.294)		0.128	0.014
31	7.75	1.20	0.155	(0.290)		0.140	0.016
32	8.00	1.30	0.168	(0.286)		0.151	0.017
33	8.25	1.50	0.194	(0.282)		0.175	0.019
34	8.50	1.50	0.194	(0.278)		0.175	0.019
35	8.75	1.60	0.207	(0.274)		0.186	0.021
36	9.00	1.70	0.220	(0.270)		0.198	0.022
37	9.25	1.90	0.246	(0.267)		0.221	0.025
38	9.50	2.00	0.259	(0.263)		0.233	0.026
39	9.75	2.10	0.272	(0.259)		0.244	0.027
40	10.00	2.20	0.285	0.255	(0.256)		0.029

41	10.25	1.50	0.194	(0.252)	0.175	0.019
42	10.50	1.50	0.194	(0.248)	0.175	0.019
43	10.75	2.00	0.259	(0.244)	0.233	0.026
44	11.00	2.00	0.259	(0.241)	0.233	0.026
45	11.25	1.90	0.246	(0.237)	0.221	0.025
46	11.50	1.90	0.246	(0.234)	0.221	0.025
47	11.75	1.70	0.220	(0.230)	0.198	0.022
48	12.00	1.80	0.233	(0.227)	0.210	0.023
49	12.25	2.50	0.323	0.223	(0.291)	0.100
50	12.50	2.60	0.336	0.220	(0.303)	0.116
51	12.75	2.80	0.362	0.217	(0.326)	0.145
52	13.00	2.90	0.375	0.214	(0.338)	0.162
53	13.25	3.40	0.440	0.210	(0.396)	0.230
54	13.50	3.40	0.440	0.207	(0.396)	0.233
55	13.75	2.30	0.298	0.204	(0.268)	0.094
56	14.00	2.30	0.298	0.201	(0.268)	0.097
57	14.25	2.70	0.349	0.198	(0.314)	0.151
58	14.50	2.60	0.336	0.195	(0.303)	0.142
59	14.75	2.60	0.336	0.192	(0.303)	0.145
60	15.00	2.50	0.323	0.189	(0.291)	0.135
61	15.25	2.40	0.310	0.186	(0.279)	0.124
62	15.50	2.30	0.298	0.183	(0.268)	0.114
63	15.75	1.90	0.246	0.180	(0.221)	0.065
64	16.00	1.90	0.246	0.178	(0.221)	0.068
65	16.25	0.40	0.052	(0.175)	0.047	0.005
66	16.50	0.40	0.052	(0.172)	0.047	0.005
67	16.75	0.30	0.039	(0.170)	0.035	0.004
68	17.00	0.30	0.039	(0.167)	0.035	0.004
69	17.25	0.50	0.065	(0.165)	0.058	0.006
70	17.50	0.50	0.065	(0.162)	0.058	0.006
71	17.75	0.50	0.065	(0.160)	0.058	0.006
72	18.00	0.40	0.052	(0.157)	0.047	0.005
73	18.25	0.40	0.052	(0.155)	0.047	0.005
74	18.50	0.40	0.052	(0.153)	0.047	0.005
75	18.75	0.30	0.039	(0.150)	0.035	0.004
76	19.00	0.20	0.026	(0.148)	0.023	0.003
77	19.25	0.30	0.039	(0.146)	0.035	0.004
78	19.50	0.40	0.052	(0.144)	0.047	0.005
79	19.75	0.30	0.039	(0.142)	0.035	0.004
80	20.00	0.20	0.026	(0.140)	0.023	0.003
81	20.25	0.30	0.039	(0.138)	0.035	0.004
82	20.50	0.30	0.039	(0.137)	0.035	0.004
83	20.75	0.30	0.039	(0.135)	0.035	0.004
84	21.00	0.20	0.026	(0.133)	0.023	0.003
85	21.25	0.30	0.039	(0.132)	0.035	0.004
86	21.50	0.20	0.026	(0.130)	0.023	0.003
87	21.75	0.30	0.039	(0.129)	0.035	0.004
88	22.00	0.20	0.026	(0.127)	0.023	0.003
89	22.25	0.30	0.039	(0.126)	0.035	0.004
90	22.50	0.20	0.026	(0.125)	0.023	0.003
91	22.75	0.20	0.026	(0.124)	0.023	0.003
92	23.00	0.20	0.026	(0.123)	0.023	0.003
93	23.25	0.20	0.026	(0.122)	0.023	0.003
94	23.50	0.20	0.026	(0.121)	0.023	0.003
95	23.75	0.20	0.026	(0.121)	0.023	0.003
96	24.00	0.20	0.026	(0.120)	0.023	0.003

(Loss Rate Not Used)

Sum = 100.0 Sum = 2.9

Flood volume = Effective rainfall 0.72(In)
times area 18.6(Ac.)/[(In)/(Ft.)] = 1.1(Ac.Ft)
Total soil loss = 2.51(In)
Total soil loss = 3.902(Ac.Ft)
Total rainfall = 3.23(In)
Flood volume = 48746.6 Cubic Feet
Total soil loss = 169966.0 Cubic Feet

Peak flow rate of this hydrograph = 4.354(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0007	0.03	Q				
0+30	0.0021	0.07	Q				
0+45	0.0036	0.07	Q				
1+ 0	0.0054	0.09	Q				
1+15	0.0071	0.08	Q				
1+30	0.0086	0.07	Q				
1+45	0.0101	0.07	Q				
2+ 0	0.0120	0.09	Q				
2+15	0.0140	0.10	Q				
2+30	0.0160	0.10	Q				
2+45	0.0183	0.11	Q				
3+ 0	0.0208	0.12	Q				
3+15	0.0234	0.12	Q				
3+30	0.0259	0.12	Q				
3+45	0.0284	0.12	QV				
4+ 0	0.0312	0.14	QV				
4+15	0.0343	0.15	QV				
4+30	0.0376	0.16	QV				
4+45	0.0411	0.17	QV				
5+ 0	0.0450	0.19	QV				
5+15	0.0483	0.16	QV				
5+30	0.0517	0.16	QV				
5+45	0.0555	0.19	QV				
6+ 0	0.0596	0.19	Q V				
6+15	0.0639	0.21	Q V				
6+30	0.0685	0.22	Q V				
6+45	0.0733	0.24	Q V				
7+ 0	0.0783	0.24	Q V				
7+15	0.0834	0.24	Q V				
7+30	0.0887	0.26	|Q V				
7+45	0.0946	0.28	|Q V				
8+ 0	0.1010	0.31	|Q V				
8+15	0.1082	0.35	|Q V				
8+30	0.1158	0.36	|Q V				
8+45	0.1236	0.38	|Q V				
9+ 0	0.1320	0.41	|Q V				
9+15	0.1413	0.45	|Q V				
9+30	0.1512	0.48	|Q V				
9+45	0.1616	0.50	| Q V				
10+ 0	0.1727	0.54	| Q V				
10+15	0.1814	0.42	|Q V				
10+30	0.1889	0.36	|Q V				
10+45	0.1982	0.45	|Q V				
11+ 0	0.2082	0.49	|Q V				
11+15	0.2179	0.47	|Q V				
11+30	0.2275	0.46	|Q V				
11+45	0.2363	0.43	|Q V				
12+ 0	0.2452	0.43	|Q V				
12+15	0.2752	1.45	| Q V				
12+30	0.3184	2.09	| Q V				
12+45	0.3715	2.57	| Q V				
13+ 0	0.4324	2.95	| |Q V				
13+15	0.5136	3.93	| | Q V |			
13+30	0.6036	4.35	| | Q V				
13+45	0.6559	2.53	| Q | V				
14+ 0	0.6931	1.80	| Q | V				
14+15	0.7456	2.54	| Q | V				
14+30	0.8017	2.71	| Q | V |			
14+45	0.8574	2.70	| Q | V			
15+ 0	0.9108	2.58	| Q | V			
15+15	0.9603	2.39	| Q| | V			
15+30	1.0058	2.21	| Q | | V			
15+45	1.0369	1.50	| Q | | V			
16+ 0	1.0630	1.27	| Q | | V			
16+15	1.0723	0.45	|Q | | V |			

```
   16+30       1.0743      0.10  Q         |         |         |       V |
   16+45       1.0759      0.08  Q         |         |         |       V |
   17+ 0       1.0774      0.07  Q         |         |         |       V |
   17+15       1.0797      0.11  Q         |         |         |       V |
   17+30       1.0822      0.12  Q         |         |         |       V |
   17+45       1.0847      0.12  Q         |         |         |       V |
   18+ 0       1.0868      0.10  Q         |         |         |       V |
   18+15       1.0888      0.10  Q         |         |         |       V |
   18+30       1.0909      0.10  Q         |         |         |       V |
   18+45       1.0925      0.08  Q         |         |         |        V|
   19+ 0       1.0937      0.06  Q         |         |         |        V|
   19+15       1.0950      0.07  Q         |         |         |        V|
   19+30       1.0969      0.09  Q         |         |         |        V|
   19+45       1.0985      0.08  Q         |         |         |        V|
   20+ 0       1.0997      0.06  Q         |         |         |        V|
   20+15       1.1010      0.07  Q         |         |         |        V|
   20+30       1.1026      0.07  Q         |         |         |        V|
   20+45       1.1041      0.07  Q         |         |         |        V|
   21+ 0       1.1052      0.06  Q         |         |         |        V|
   21+15       1.1066      0.07  Q         |         |         |        V|
   21+30       1.1077      0.06  Q         |         |         |        V|
   21+45       1.1091      0.07  Q         |         |         |        V|
   22+ 0       1.1102      0.06  Q         |         |         |        V|
   22+15       1.1116      0.07  Q         |         |         |        V|
   22+30       1.1127      0.06  Q         |         |         |        V|
   22+45       1.1137      0.05  Q         |         |         |        V|
   23+ 0       1.1148      0.05  Q         |         |         |        V|
   23+15       1.1158      0.05  Q         |         |         |        V|
   23+30       1.1168      0.05  Q         |         |         |        V|
   23+45       1.1178      0.05  Q         |         |         |        V|
   24+ 0       1.1188      0.05  Q         |         |         |        V|
   24+15       1.1191      0.01  Q         |         |         |         V
-------------------------------------------------------------------------
```

- Area 'C' – 100 Year - Pre-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 02/11/19 File: EXC1001100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	0.55	10.25

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	1.30	24.22

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 1.300(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.300(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      80.3  91.2      0.115     0.000        0.115       1.000      0.115
                                                        Sum (F) =   0.115
      Area averaged mean soil loss (F) (In/Hr) =  0.115
      Minimum soil loss rate ((In/Hr)) =  0.057
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.900
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5300
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                           Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083        162.871         36.151             6.788
          2   0.167        325.743         46.052             8.646
          3   0.250        488.614         10.486             1.969
          4   0.333        651.486          4.490             0.843
          5   0.417        814.357          2.821             0.530
                                  Sum = 100.000   Sum=      18.776
-------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     3.40      0.530          0.115    (  0.477)        0.416
   2   0.17     4.70      0.733          0.115    (  0.660)        0.618
   3   0.25     4.70      0.733          0.115    (  0.660)        0.618
   4   0.33     5.10      0.795          0.115    (  0.716)        0.681
   5   0.42     5.80      0.905          0.115    (  0.814)        0.790
   6   0.50     5.90      0.920          0.115    (  0.828)        0.806
   7   0.58     7.10      1.107          0.115    (  0.997)        0.993
   8   0.67     8.70      1.357          0.115    (  1.221)        1.242
   9   0.75    13.20      2.059          0.115    (  1.853)        1.944
  10   0.83    29.70      4.632          0.115    (  4.169)        4.518
  11   0.92     7.70      1.201          0.115    (  1.081)        1.086
  12   1.00     4.00      0.624          0.115    (  0.562)        0.509
               (Loss Rate Not Used)
     Sum =     100.0                                 Sum =    14.2
       Flood volume = Effective rainfall      1.19(In)
        times area      18.6(Ac.)/[(In)/(Ft.)] =       1.8(Ac.Ft)
       Total soil loss =      0.11(In)
       Total soil loss =     0.178(Ac.Ft)
       Total rainfall =      1.30(In)
       Flood volume =       80146.0 Cubic Feet
       Total soil loss =        7754.1 Cubic Feet
       ------------------------------------------------------------------------
        Peak flow rate of this hydrograph =     51.864(CFS)
       ------------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
       ------------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

       ------------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
  ----------------------------------------------------------------------
    0+ 5       0.0194      2.82  VQ        |         |         |         |
    0+10       0.0731      7.80  |V   Q    |         |         |         |
```

```
    0+15       0.1445     10.37  |  V  Q   |         |         |         |
    0+20       0.2240     11.54  |   V  Q  |         |         |         |
    0+25       0.3150     13.21  |     V Q |         |         |         |
    0+30       0.4149     14.50  |        Q|         |         |         |
    0+35       0.5262     16.17  |         QV        |         |         |
    0+40       0.6615     19.64  |          |  QV    |         |         |
    0+45       0.8475     27.00  |          |       Q |         |         |
    0+50       1.2001     51.21  |          |         |     V   |   Q     |
    0+55       1.5573     51.86  |          |         |         |  VQ     |
    1+ 0       1.7230     24.05  |          |     Q   |         |      V  |
    1+ 5       1.8014     11.39  |      Q   |         |         |        V|
    1+10       1.8311      4.31  | Q        |         |         |        V|
    1+15       1.8380      1.01  Q          |         |         |        V|
    1+20       1.8399      0.27  Q          |         |         |        V|
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 02/11/19 File: EXC1003100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	0.85	15.84

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	2.00	37.26

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.3	91.2	0.115	0.000	0.115	1.000	0.115
					Sum (F) =	0.115

Area averaged mean soil loss (F) (In/Hr) = 0.115
Minimum soil loss rate ((In/Hr)) = 0.057
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	162.871	36.151	6.788
2	0.167	325.743	46.052	8.646
3	0.250	488.614	10.486	1.969
4	0.333	651.486	4.490	0.843
5	0.417	814.357	2.821	0.530
			Sum = 100.000	Sum= 18.776

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.312	0.115	(0.281)	0.197
2	0.17	1.30	0.312	0.115	(0.281)	0.197
3	0.25	1.10	0.264	0.115	(0.238)	0.149
4	0.33	1.50	0.360	0.115	(0.324)	0.245
5	0.42	1.50	0.360	0.115	(0.324)	0.245
6	0.50	1.80	0.432	0.115	(0.389)	0.317
7	0.58	1.50	0.360	0.115	(0.324)	0.245
8	0.67	1.80	0.432	0.115	(0.389)	0.317
9	0.75	1.80	0.432	0.115	(0.389)	0.317
10	0.83	1.50	0.360	0.115	(0.324)	0.245
11	0.92	1.60	0.384	0.115	(0.346)	0.269
12	1.00	1.80	0.432	0.115	(0.389)	0.317
13	1.08	2.20	0.528	0.115	(0.475)	0.413
14	1.17	2.20	0.528	0.115	(0.475)	0.413
15	1.25	2.20	0.528	0.115	(0.475)	0.413
16	1.33	2.00	0.480	0.115	(0.432)	0.365
17	1.42	2.60	0.624	0.115	(0.562)	0.509
18	1.50	2.70	0.648	0.115	(0.583)	0.533
19	1.58	2.40	0.576	0.115	(0.518)	0.461
20	1.67	2.70	0.648	0.115	(0.583)	0.533
21	1.75	3.30	0.792	0.115	(0.713)	0.677
22	1.83	3.10	0.744	0.115	(0.670)	0.629
23	1.92	2.90	0.696	0.115	(0.626)	0.581
24	2.00	3.00	0.720	0.115	(0.648)	0.605
25	2.08	3.10	0.744	0.115	(0.670)	0.629
26	2.17	4.20	1.008	0.115	(0.907)	0.893
27	2.25	5.00	1.200	0.115	(1.080)	1.085
28	2.33	3.50	0.840	0.115	(0.756)	0.725
29	2.42	6.80	1.632	0.115	(1.469)	1.517
30	2.50	7.30	1.752	0.115	(1.577)	1.637
31	2.58	8.20	1.968	0.115	(1.771)	1.853
32	2.67	5.90	1.416	0.115	(1.274)	1.301
33	2.75	2.00	0.480	0.115	(0.432)	0.365
34	2.83	1.80	0.432	0.115	(0.389)	0.317
35	2.92	1.80	0.432	0.115	(0.389)	0.317
36	3.00	0.60	0.144	0.115	(0.130)	0.029
		(Loss Rate Not Used)				

```
   Sum =     100.0                                    Sum =    19.9
      Flood volume = Effective rainfall      1.66(In)
       times area      18.6(Ac.)/[(In)/(Ft.)] =       2.6(Ac.Ft)
      Total soil loss =      0.34(In)
      Total soil loss =     0.534(Ac.Ft)
      Total rainfall =      2.00(In)
      Flood volume =      111980.5 Cubic Feet
      Total soil loss =       23262.3 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     30.924(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
 ------------------------------------------------------------------------
   0+ 5       0.0092      1.34  VQ        |         |         |         |
   0+10       0.0302      3.05  V  Q      |         |         |         |
   0+15       0.0516      3.11  V  Q      |         |         |         |
   0+20       0.0758      3.51  |V Q      |         |         |         |
   0+25       0.1058      4.35  |V  Q     |         |         |         |
   0+30       0.1402      4.99  | V Q     |         |         |         |
   0+35       0.1759      5.18  | V  Q    |         |         |         |
   0+40       0.2119      5.24  |  V Q    |         |         |         |
   0+45       0.2517      5.78  |  V Q    |         |         |         |
   0+50       0.2890      5.41  |   VQ    |         |         |         |
   0+55       0.3233      4.97  |   QV    |         |         |         |
   1+ 0       0.3605      5.40  |    Q    |         |         |         |
   1+ 5       0.4049      6.46  |     Q   |         |         |         |
   1+10       0.4557      7.36  |      Q  |         |         |         |
   1+15       0.5081      7.61  |      Q  |         |         |         |
   1+20       0.5589      7.39  |      QV |         |         |         |
   1+25       0.6140      8.00  |       QV|         |         |         |
   1+30       0.6782      9.31  |        QV         |         |         |
   1+35       0.7421      9.28  |        Q|V        |         |         |
   1+40       0.8060      9.29  |        Q| V       |         |         |
   1+45       0.8807     10.84  |         Q  V      |         |         |
   1+50       0.9623     11.85  |         |Q  V     |         |         |
   1+55       1.0410     11.42  |         |Q    V   |         |         |
   2+ 0       1.1183     11.23  |         |Q     V  |         |         |
   2+ 5       1.1978     11.54  |         |Q      V |         |         |
   2+10       1.2910     13.53  |         |  Q      V         |         |
   2+15       1.4092     17.16  |         |      Q  |V        |         |
   2+20       1.5257     16.92  |         |     Q   |  V      |         |
   2+25       1.6621     19.80  |         |        Q|    V    |         |
   2+30       1.8485     27.06  |         |         |      QV |         |
   2+35       2.0614     30.92  |         |         |         Q V       |
   2+40       2.2664     29.76  |         |         |        Q|    V    |
   2+45       2.4012     19.57  |         |        Q|         |      V  |
   2+50       2.4722     10.31  |         Q         |         |       V |
   2+55       2.5252      7.70  |      Q  |         |         |        V|
   3+ 0       2.5567      4.57  |   Q     |         |         |        V|
   3+ 5       2.5659      1.34  |Q        |         |         |        V|
   3+10       2.5693      0.49  Q         |         |         |        V|
   3+15       2.5706      0.19  Q         |         |         |        V|
   3+20       2.5707      0.02  Q         |         |         |         V
------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 02/11/19 File: EXC1006100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘C’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	1.20	22.36

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	3.00	55.89

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.3	91.2	0.115	0.000	0.115	1.000	0.115
					Sum (F) =	0.115

Area averaged mean soil loss (F) (In/Hr) = 0.115
Minimum soil loss rate ((In/Hr)) = 0.057
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

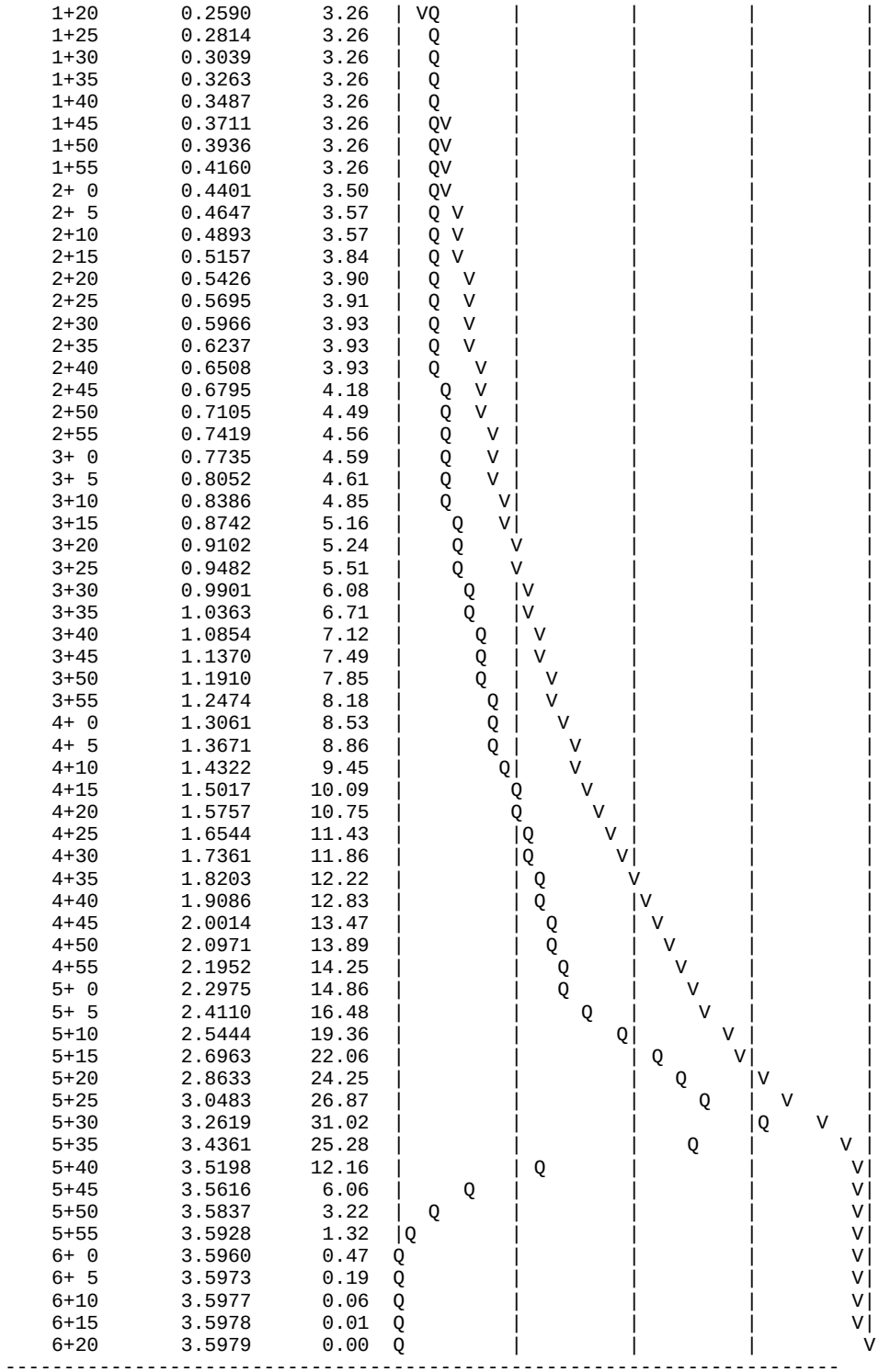
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	162.871	36.151	6.788
2	0.167	325.743	46.052	8.646
3	0.250	488.614	10.486	1.969
4	0.333	651.486	4.490	0.843
5	0.417	814.357	2.821	0.530
			Sum = 100.000	Sum= 18.776

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.180	0.115	(0.162)	0.065
2	0.17	0.60	0.216	0.115	(0.194)	0.101
3	0.25	0.60	0.216	0.115	(0.194)	0.101
4	0.33	0.60	0.216	0.115	(0.194)	0.101
5	0.42	0.60	0.216	0.115	(0.194)	0.101
6	0.50	0.70	0.252	0.115	(0.227)	0.137
7	0.58	0.70	0.252	0.115	(0.227)	0.137
8	0.67	0.70	0.252	0.115	(0.227)	0.137
9	0.75	0.70	0.252	0.115	(0.227)	0.137
10	0.83	0.70	0.252	0.115	(0.227)	0.137
11	0.92	0.70	0.252	0.115	(0.227)	0.137
12	1.00	0.80	0.288	0.115	(0.259)	0.173
13	1.08	0.80	0.288	0.115	(0.259)	0.173
14	1.17	0.80	0.288	0.115	(0.259)	0.173
15	1.25	0.80	0.288	0.115	(0.259)	0.173
16	1.33	0.80	0.288	0.115	(0.259)	0.173
17	1.42	0.80	0.288	0.115	(0.259)	0.173
18	1.50	0.80	0.288	0.115	(0.259)	0.173
19	1.58	0.80	0.288	0.115	(0.259)	0.173
20	1.67	0.80	0.288	0.115	(0.259)	0.173
21	1.75	0.80	0.288	0.115	(0.259)	0.173
22	1.83	0.80	0.288	0.115	(0.259)	0.173
23	1.92	0.80	0.288	0.115	(0.259)	0.173
24	2.00	0.90	0.324	0.115	(0.292)	0.209
25	2.08	0.80	0.288	0.115	(0.259)	0.173
26	2.17	0.90	0.324	0.115	(0.292)	0.209
27	2.25	0.90	0.324	0.115	(0.292)	0.209
28	2.33	0.90	0.324	0.115	(0.292)	0.209
29	2.42	0.90	0.324	0.115	(0.292)	0.209
30	2.50	0.90	0.324	0.115	(0.292)	0.209
31	2.58	0.90	0.324	0.115	(0.292)	0.209
32	2.67	0.90	0.324	0.115	(0.292)	0.209
33	2.75	1.00	0.360	0.115	(0.324)	0.245
34	2.83	1.00	0.360	0.115	(0.324)	0.245
35	2.92	1.00	0.360	0.115	(0.324)	0.245
36	3.00	1.00	0.360	0.115	(0.324)	0.245
37	3.08	1.00	0.360	0.115	(0.324)	0.245

```
38   3.17     1.10      0.396          0.115    (  0.356)        0.281
39   3.25     1.10      0.396          0.115    (  0.356)        0.281
40   3.33     1.10      0.396          0.115    (  0.356)        0.281
41   3.42     1.20      0.432          0.115    (  0.389)        0.317
42   3.50     1.30      0.468          0.115    (  0.421)        0.353
43   3.58     1.40      0.504          0.115    (  0.454)        0.389
44   3.67     1.40      0.504          0.115    (  0.454)        0.389
45   3.75     1.50      0.540          0.115    (  0.486)        0.425
46   3.83     1.50      0.540          0.115    (  0.486)        0.425
47   3.92     1.60      0.576          0.115    (  0.518)        0.461
48   4.00     1.60      0.576          0.115    (  0.518)        0.461
49   4.08     1.70      0.612          0.115    (  0.551)        0.497
50   4.17     1.80      0.648          0.115    (  0.583)        0.533
51   4.25     1.90      0.684          0.115    (  0.616)        0.569
52   4.33     2.00      0.720          0.115    (  0.648)        0.605
53   4.42     2.10      0.756          0.115    (  0.680)        0.641
54   4.50     2.10      0.756          0.115    (  0.680)        0.641
55   4.58     2.20      0.792          0.115    (  0.713)        0.677
56   4.67     2.30      0.828          0.115    (  0.745)        0.713
57   4.75     2.40      0.864          0.115    (  0.778)        0.749
58   4.83     2.40      0.864          0.115    (  0.778)        0.749
59   4.92     2.50      0.900          0.115    (  0.810)        0.785
60   5.00     2.60      0.936          0.115    (  0.842)        0.821
61   5.08     3.10      1.116          0.115    (  1.004)        1.001
62   5.17     3.60      1.296          0.115    (  1.166)        1.181
63   5.25     3.90      1.404          0.115    (  1.264)        1.289
64   5.33     4.20      1.512          0.115    (  1.361)        1.397
65   5.42     4.70      1.692          0.115    (  1.523)        1.577
66   5.50     5.60      2.016          0.115    (  1.814)        1.901
67   5.58     1.90      0.684          0.115    (  0.616)        0.569
68   5.67     0.90      0.324          0.115    (  0.292)        0.209
69   5.75     0.60      0.216          0.115    (  0.194)        0.101
70   5.83     0.50      0.180          0.115    (  0.162)        0.065
71   5.92     0.30      0.108       (  0.115)       0.097        0.011
72   6.00     0.20      0.072       (  0.115)       0.065        0.007
              (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    27.8
      Flood volume = Effective rainfall      2.32(In)
       times area      18.6(Ac.)/[(In)/(Ft.)] =       3.6(Ac.Ft)
      Total soil loss =      0.68(In)
      Total soil loss =     1.059(Ac.Ft)
      Total rainfall =      3.00(In)
      Flood volume =      156722.6 Cubic Feet
      Total soil loss =       46145.2 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     31.022(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
-------------------------------------------------------------------------
  0+ 5       0.0031      0.44  Q         |         |         |         |
  0+10       0.0117      1.25  VQ        |         |         |         |
  0+15       0.0233      1.69  VQ        |         |         |         |
  0+20       0.0359      1.82  VQ        |         |         |         |
  0+25       0.0489      1.88  VQ        |         |         |         |
  0+30       0.0636      2.15  V Q       |         |         |         |
  0+35       0.0806      2.46  V Q       |         |         |         |
  0+40       0.0980      2.53  |VQ       |         |         |         |
  0+45       0.1156      2.56  |VQ       |         |         |         |
  0+50       0.1334      2.58  |VQ       |         |         |         |
  0+55       0.1512      2.58  |VQ       |         |         |         |
  1+ 0       0.1706      2.82  |VQ       |         |         |         |
  1+ 5       0.1922      3.14  | VQ      |         |         |         |
  1+10       0.2143      3.21  | VQ      |         |         |         |
  1+15       0.2366      3.24  | VQ      |         |         |         |
```



U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: EXC10024100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'C'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR HOUR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE

Drainage Area = 18.63(Ac.) = 0.029 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.63(Ac.) = 0.029 Sq. Mi.
Length along longest watercourse = 1415.00(Ft.)
Length along longest watercourse measured to centroid = 500.00(Ft.)
Length along longest watercourse = 0.268 Mi.
Length along longest watercourse measured to centroid = 0.095 Mi.
Difference in elevation = 191.00(Ft.)
Slope along watercourse = 712.7067 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.051 Hr.
Lag time = 3.07 Min.
25% of lag time = 0.77 Min.
40% of lag time = 1.23 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	2.00	37.26

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.63	5.00	93.15

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 5.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 5.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
18.630	80.30	0.000

Total Area Entered = 18.63(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
80.3	91.2	0.115	0.000	0.115	1.000	0.115
					Sum (F) =	0.115

Area averaged mean soil loss (F) (In/Hr) = 0.115
Minimum soil loss rate ((In/Hr)) = 0.057
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	488.614	70.347	13.208
2	0.500	977.229	29.653	5.567
			Sum = 100.000 Sum=	18.776

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.25	0.20	0.040	(0.202)		0.036	0.004
2	0.50	0.30	0.060	(0.200)		0.054	0.006
3	0.75	0.30	0.060	(0.198)		0.054	0.006
4	1.00	0.40	0.080	(0.195)		0.072	0.008
5	1.25	0.30	0.060	(0.193)		0.054	0.006
6	1.50	0.30	0.060	(0.191)		0.054	0.006
7	1.75	0.30	0.060	(0.189)		0.054	0.006
8	2.00	0.40	0.080	(0.186)		0.072	0.008
9	2.25	0.40	0.080	(0.184)		0.072	0.008
10	2.50	0.40	0.080	(0.182)		0.072	0.008
11	2.75	0.50	0.100	(0.180)		0.090	0.010
12	3.00	0.50	0.100	(0.177)		0.090	0.010
13	3.25	0.50	0.100	(0.175)		0.090	0.010
14	3.50	0.50	0.100	(0.173)		0.090	0.010
15	3.75	0.50	0.100	(0.171)		0.090	0.010
16	4.00	0.60	0.120	(0.169)		0.108	0.012
17	4.25	0.60	0.120	(0.167)		0.108	0.012
18	4.50	0.70	0.140	(0.164)		0.126	0.014
19	4.75	0.70	0.140	(0.162)		0.126	0.014
20	5.00	0.80	0.160	(0.160)		0.144	0.016
21	5.25	0.60	0.120	(0.158)		0.108	0.012
22	5.50	0.70	0.140	(0.156)		0.126	0.014
23	5.75	0.80	0.160	(0.154)		0.144	0.016
24	6.00	0.80	0.160	(0.152)		0.144	0.016
25	6.25	0.90	0.180	0.150	(	0.162)	0.030
26	6.50	0.90	0.180	0.148	(	0.162)	0.032
27	6.75	1.00	0.200	0.146	(	0.180)	0.054
28	7.00	1.00	0.200	0.144	(	0.180)	0.056
29	7.25	1.00	0.200	0.142	(	0.180)	0.058
30	7.50	1.10	0.220	0.140	(	0.198)	0.080
31	7.75	1.20	0.240	0.138	(	0.216)	0.102
32	8.00	1.30	0.260	0.136	(	0.234)	0.124
33	8.25	1.50	0.300	0.134	(	0.270)	0.166
34	8.50	1.50	0.300	0.133	(	0.270)	0.167
35	8.75	1.60	0.320	0.131	(	0.288)	0.189
36	9.00	1.70	0.340	0.129	(	0.306)	0.211
37	9.25	1.90	0.380	0.127	(	0.342)	0.253
38	9.50	2.00	0.400	0.125	(	0.360)	0.275
39	9.75	2.10	0.420	0.123	(	0.378)	0.297
40	10.00	2.20	0.440	0.122	(	0.396)	0.318

41	10.25	1.50	0.300		0.120	(0.270)		0.180
42	10.50	1.50	0.300		0.118	(0.270)		0.182
43	10.75	2.00	0.400		0.116	(0.360)		0.284
44	11.00	2.00	0.400		0.115	(0.360)		0.285
45	11.25	1.90	0.380		0.113	(0.342)		0.267
46	11.50	1.90	0.380		0.111	(0.342)		0.269
47	11.75	1.70	0.340		0.110	(0.306)		0.230
48	12.00	1.80	0.360		0.108	(0.324)		0.252
49	12.25	2.50	0.500		0.106	(0.450)		0.393
50	12.50	2.60	0.520		0.105	(0.468)		0.415
51	12.75	2.80	0.560		0.103	(0.504)		0.457
52	13.00	2.90	0.580		0.102	(0.522)		0.478
53	13.25	3.40	0.680		0.100	(0.612)		0.580
54	13.50	3.40	0.680		0.099	(0.612)		0.581
55	13.75	2.30	0.460		0.097	(0.414)		0.363
56	14.00	2.30	0.460		0.096	(0.414)		0.364
57	14.25	2.70	0.540		0.094	(0.486)		0.446
58	14.50	2.60	0.520		0.093	(0.468)		0.427
59	14.75	2.60	0.520		0.091	(0.468)		0.429
60	15.00	2.50	0.500		0.090	(0.450)		0.410
61	15.25	2.40	0.480		0.089	(0.432)		0.391
62	15.50	2.30	0.460		0.087	(0.414)		0.373
63	15.75	1.90	0.380		0.086	(0.342)		0.294
64	16.00	1.90	0.380		0.085	(0.342)		0.295
65	16.25	0.40	0.080	(0.083)		0.072		0.008
66	16.50	0.40	0.080	(0.082)		0.072		0.008
67	16.75	0.30	0.060	(0.081)		0.054		0.006
68	17.00	0.30	0.060	(0.080)		0.054		0.006
69	17.25	0.50	0.100		0.078	(0.090)		0.022
70	17.50	0.50	0.100		0.077	(0.090)		0.023
71	17.75	0.50	0.100		0.076	(0.090)		0.024
72	18.00	0.40	0.080	(0.075)		0.072		0.008
73	18.25	0.40	0.080	(0.074)		0.072		0.008
74	18.50	0.40	0.080	(0.073)		0.072		0.008
75	18.75	0.30	0.060	(0.072)		0.054		0.006
76	19.00	0.20	0.040	(0.071)		0.036		0.004
77	19.25	0.30	0.060	(0.070)		0.054		0.006
78	19.50	0.40	0.080		0.069	(0.072)		0.011
79	19.75	0.30	0.060	(0.068)		0.054		0.006
80	20.00	0.20	0.040	(0.067)		0.036		0.004
81	20.25	0.30	0.060	(0.066)		0.054		0.006
82	20.50	0.30	0.060	(0.065)		0.054		0.006
83	20.75	0.30	0.060	(0.064)		0.054		0.006
84	21.00	0.20	0.040	(0.064)		0.036		0.004
85	21.25	0.30	0.060	(0.063)		0.054		0.006
86	21.50	0.20	0.040	(0.062)		0.036		0.004
87	21.75	0.30	0.060	(0.061)		0.054		0.006
88	22.00	0.20	0.040	(0.061)		0.036		0.004
89	22.25	0.30	0.060	(0.060)		0.054		0.006
90	22.50	0.20	0.040	(0.060)		0.036		0.004
91	22.75	0.20	0.040	(0.059)		0.036		0.004
92	23.00	0.20	0.040	(0.059)		0.036		0.004
93	23.25	0.20	0.040	(0.058)		0.036		0.004
94	23.50	0.20	0.040	(0.058)		0.036		0.004
95	23.75	0.20	0.040	(0.058)		0.036		0.004
96	24.00	0.20	0.040	(0.057)		0.036		0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 11.5

Flood volume = Effective rainfall 2.88(In)
times area 18.6(Ac.)/[(In)/(Ft.)] = 4.5(Ac.Ft)
Total soil loss = 2.12(In)
Total soil loss = 3.287(Ac.Ft)
Total rainfall = 5.00(In)
Flood volume = 194953.5 Cubic Feet
Total soil loss = 143168.7 Cubic Feet

Peak flow rate of this hydrograph = 10.911(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 5.0 10.0 15.0 20.0
0+15	0.0011	0.05	Q | | | |
0+30	0.0032	0.10	Q | | | |
0+45	0.0055	0.11	Q | | | |
1+ 0	0.0084	0.14	Q | | | |
1+15	0.0110	0.12	Q | | | |
1+30	0.0133	0.11	Q | | | |
1+45	0.0156	0.11	Q | | | |
2+ 0	0.0185	0.14	Q | | | |
2+15	0.0216	0.15	Q | | | |
2+30	0.0247	0.15	Q | | | |
2+45	0.0283	0.18	Q | | | |
3+ 0	0.0322	0.19	Q | | | |
3+15	0.0361	0.19	Q | | | |
3+30	0.0400	0.19	Q | | | |
3+45	0.0439	0.19	Q | | | |
4+ 0	0.0483	0.21	Q | | | |
4+15	0.0530	0.23	Q | | | |
4+30	0.0582	0.25	Q | | | |
4+45	0.0636	0.26	Q | | | |
5+ 0	0.0696	0.29	Q | | | |
5+15	0.0747	0.25	Q | | | |
5+30	0.0799	0.25	Q | | | |
5+45	0.0859	0.29	Q | | | |
6+ 0	0.0921	0.30	Q | | | |
6+15	0.1021	0.49	Q | | | |
6+30	0.1143	0.59	Q | | | |
6+45	0.1327	0.89	|Q | | | |
7+ 0	0.1542	1.04	|VQ | | | |
7+15	0.1764	1.08	|VQ | | | |
7+30	0.2049	1.38	|VQ | | | |
7+45	0.2419	1.79	| VQ | | | |
8+ 0	0.2874	2.20	| V Q | | | |
8+15	0.3468	2.88	| V Q | | | |
8+30	0.4116	3.13	| V Q | | | |
8+45	0.4825	3.43	| V Q | | | |
9+ 0	0.5619	3.84	| V Q | | | |
9+15	0.6553	4.52	| V Q| | | |
9+30	0.7594	5.04	| V Q | | |
9+45	0.8720	5.45	| V Q | | |
10+ 0	0.9931	5.86	| V |Q | | |
10+15	1.0789	4.15	| QV| | | |
10+30	1.1492	3.41	| Q V | | |
10+45	1.2476	4.76	| Q V | | |
11+ 0	1.3581	5.35	| Q V | | |
11+15	1.4638	5.12	| Q V | | |
11+30	1.5678	5.04	| Q V | | |
11+45	1.6616	4.54	| Q| V | | |
12+ 0	1.7569	4.61	| Q| V | | |
12+15	1.8933	6.60	| | Q V | | |
12+30	2.0519	7.68	| | Q V | | |
12+45	2.2244	8.35	| | Q V| | |
13+ 0	2.4075	8.86	| | Q V | |
13+15	2.6208	10.33	| | Q V | |
13+30	2.8463	10.91	| | |Q V | |
13+45	3.0122	8.03	| | Q | V | |
14+ 0	3.1534	6.83	| Q | V | |
14+15	3.3170	7.92	| Q | V| |
14+30	3.4850	8.13	| Q | V |
14+45	3.6511	8.04	| Q | | V |
15+ 0	3.8124	7.80	| Q | | V |
15+15	3.9664	7.46	| Q | | V |
15+30	4.1132	7.11	| Q | | V |
15+45	4.2364	5.96	|Q | | V |
16+ 0	4.3509	5.54	|Q | | V |
16+15	4.3871	1.75	| Q | | | V|

```
   16+30       4.3902      0.15  Q         |         |         |        V|
   16+45       4.3927      0.12  Q         |         |         |        V|
   17+ 0       4.3950      0.11  Q         |         |         |        V|
   17+15       4.4016      0.32  Q         |         |         |        V|
   17+30       4.4103      0.42  Q         |         |         |        V|
   17+45       4.4195      0.44  Q         |         |         |        V|
   18+ 0       4.4244      0.24  Q         |         |         |        V|
   18+15       4.4275      0.15  Q         |         |         |        V|
   18+30       4.4306      0.15  Q         |         |         |        V|
   18+45       4.4332      0.12  Q         |         |         |        V|
   19+ 0       4.4350      0.09  Q         |         |         |        V|
   19+15       4.4371      0.10  Q         |         |         |        V|
   19+30       4.4408      0.18  Q         |         |         |        V|
   19+45       4.4438      0.14  Q         |         |         |        V|
   20+ 0       4.4456      0.09  Q         |         |         |        V|
   20+15       4.4477      0.10  Q         |         |         |        V|
   20+30       4.4500      0.11  Q         |         |         |        V|
   20+45       4.4523      0.11  Q         |         |         |        V|
   21+ 0       4.4541      0.09  Q         |         |         |        V|
   21+15       4.4562      0.10  Q         |         |         |        V|
   21+30       4.4580      0.09  Q         |         |         |        V|
   21+45       4.4601      0.10  Q         |         |         |        V|
   22+ 0       4.4619      0.09  Q         |         |         |        V|
   22+15       4.4640      0.10  Q         |         |         |        V|
   22+30       4.4657      0.09  Q         |         |         |        V|
   22+45       4.4673      0.08  Q         |         |         |        V|
   23+ 0       4.4688      0.08  Q         |         |         |        V|
   23+15       4.4704      0.08  Q         |         |         |        V|
   23+30       4.4720      0.08  Q         |         |         |        V|
   23+45       4.4735      0.08  Q         |         |         |        V|
   24+ 0       4.4751      0.08  Q         |         |         |        V|
   24+15       4.4755      0.02  Q         |         |         |         V
-------------------------------------------------------------------------
```

- Area 'C' – 2 Year - Post-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRC00212.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	0.55	7.79

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	1.30	18.42

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 0.550(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 0.550(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

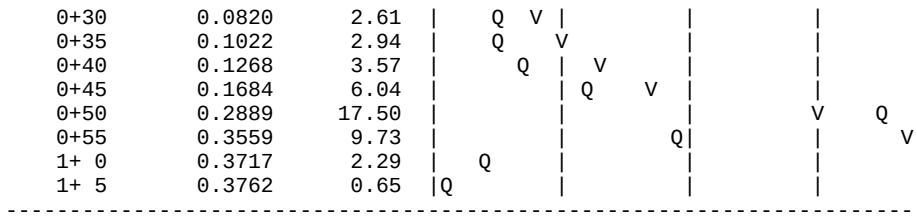
```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      68.4  49.1      0.581     0.442        0.350       1.000      0.350
                                                        Sum (F) =   0.350
      Area averaged mean soil loss (F) (In/Hr) =  0.350
      Minimum soil loss rate ((In/Hr)) =  0.175
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.546
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5200
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------------
          1   0.083        414.178         66.038              9.431
          2   0.167        828.355         33.962              4.850
                                  Sum = 100.000   Sum=      14.281
-------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
   1   0.08     4.10      0.271       (  0.350)       0.148        0.123
   2   0.17     4.60      0.304       (  0.350)       0.166        0.138
   3   0.25     4.50      0.297       (  0.350)       0.162        0.135
   4   0.33     4.90      0.323       (  0.350)       0.177        0.147
   5   0.42     5.50      0.363       (  0.350)       0.198        0.165
   6   0.50     6.40      0.422       (  0.350)       0.231        0.192
   7   0.58     7.10      0.469       (  0.350)       0.256        0.213
   8   0.67     9.00      0.594       (  0.350)       0.324        0.269
   9   0.75    12.90      0.851          0.350    (  0.465)        0.501
  10   0.83    29.50      1.947          0.350    (  1.064)        1.597
  11   0.92     7.00      0.462       (  0.350)       0.252        0.210
  12   1.00     4.50      0.297       (  0.350)       0.162        0.135
              (Loss Rate Not Used)
     Sum =     100.0                                  Sum =     3.8
        Flood volume = Effective rainfall      0.32(In)
         times area      14.2(Ac.)/[(In)/(Ft.)] =       0.4(Ac.Ft)
        Total soil loss =      0.23(In)
        Total soil loss =     0.273(Ac.Ft)
        Total rainfall =      0.55(In)
        Flood volume =       16386.4 Cubic Feet
        Total soil loss =       11900.4 Cubic Feet
        ------------------------------------------------------------------------
         Peak flow rate of this hydrograph =     17.501(CFS)
        ------------------------------------------------------------------------
        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           1 - H O U R    S T O R M
                       R u n o f f     H y d r o g r a p h
        ------------------------------------------------------------------------
                    Hydrograph in   5   Minute intervals ((CFS))

        ------------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
  ------------------------------------------------------------------------
    0+ 5       0.0080      1.16  V Q       |         |         |         |
    0+10       0.0210      1.90  | VQ      |         |         |         |
    0+15       0.0344      1.94  |  Q      |         |         |         |
    0+20       0.0484      2.04  |   QV    |         |         |         |
    0+25       0.0640      2.27  |   Q V   |         |         |         |
```


0+30 0.0820 2.61
0+35 0.1022 2.94
0+40 0.1268 3.57
0+45 0.1684 6.04
0+50 0.2889 17.50
0+55 0.3559 9.73
1+ 0 0.3717 2.29
1+ 5 0.3762 0.65

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRC00232.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	0.85	12.04

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	2.00	28.34

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 0.850(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 0.850(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
68.4	49.1	0.581	0.442	0.350	1.000	0.350
					Sum (F) =	0.350

Area averaged mean soil loss (F) (In/Hr) = 0.350
Minimum soil loss rate ((In/Hr)) = 0.175
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	414.178	66.038	9.431
2	0.167	828.355	33.962	4.850
		Sum = 100.000	Sum=	14.281

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.133	(0.350)		0.072	0.060
2	0.17	1.30	0.133	(0.350)		0.072	0.060
3	0.25	1.10	0.112	(0.350)		0.061	0.051
4	0.33	1.50	0.153	(0.350)		0.084	0.069
5	0.42	1.50	0.153	(0.350)		0.084	0.069
6	0.50	1.80	0.184	(0.350)		0.100	0.083
7	0.58	1.50	0.153	(0.350)		0.084	0.069
8	0.67	1.80	0.184	(0.350)		0.100	0.083
9	0.75	1.80	0.184	(0.350)		0.100	0.083
10	0.83	1.50	0.153	(0.350)		0.084	0.069
11	0.92	1.60	0.163	(0.350)		0.089	0.074
12	1.00	1.80	0.184	(0.350)		0.100	0.083
13	1.08	2.20	0.224	(0.350)		0.123	0.102
14	1.17	2.20	0.224	(0.350)		0.123	0.102
15	1.25	2.20	0.224	(0.350)		0.123	0.102
16	1.33	2.00	0.204	(0.350)		0.111	0.093
17	1.42	2.60	0.265	(0.350)		0.145	0.120
18	1.50	2.70	0.275	(0.350)		0.150	0.125
19	1.58	2.40	0.245	(0.350)		0.134	0.111
20	1.67	2.70	0.275	(0.350)		0.150	0.125
21	1.75	3.30	0.337	(0.350)		0.184	0.153
22	1.83	3.10	0.316	(0.350)		0.173	0.143
23	1.92	2.90	0.296	(0.350)		0.162	0.134
24	2.00	3.00	0.306	(0.350)		0.167	0.139
25	2.08	3.10	0.316	(0.350)		0.173	0.143
26	2.17	4.20	0.428	(0.350)		0.234	0.194
27	2.25	5.00	0.510	(0.350)		0.279	0.231
28	2.33	3.50	0.357	(0.350)		0.195	0.162
29	2.42	6.80	0.694	0.350	(	0.379)	0.344
30	2.50	7.30	0.745	0.350	(	0.407)	0.395
31	2.58	8.20	0.836	0.350	(	0.457)	0.487
32	2.67	5.90	0.602	(0.350)		0.329	0.273
33	2.75	2.00	0.204	(0.350)		0.111	0.093
34	2.83	1.80	0.184	(0.350)		0.100	0.083
35	2.92	1.80	0.184	(0.350)		0.100	0.083
36	3.00	0.60	0.061	(0.350)		0.033	0.028
		(Loss Rate Not Used)					
Sum =		100.0				Sum =	4.8

Flood volume = Effective rainfall 0.40(In)
times area 14.2(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)

```
      Total soil loss =      0.45(In)
      Total soil loss =     0.529(Ac.Ft)
      Total rainfall =      0.85(In)
      Flood volume =       20662.0 Cubic Feet
      Total soil loss =       23056.9 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      6.506(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
  ------------------------------------------------------------------------
    0+ 5       0.0039      0.57  V Q       |         |         |         |
    0+10       0.0098      0.86  V  Q      |         |         |         |
    0+15       0.0151      0.77  |V Q      |         |         |         |
    0+20       0.0214      0.90  |V Q      |         |         |         |
    0+25       0.0282      0.99  | VQ      |         |         |         |
    0+30       0.0359      1.12  |  VQ     |         |         |         |
    0+35       0.0432      1.06  |  VQ     |         |         |         |
    0+40       0.0509      1.12  |   Q     |         |         |         |
    0+45       0.0591      1.19  |   Q     |         |         |         |
    0+50       0.0664      1.06  |   QV    |         |         |         |
    0+55       0.0736      1.04  |   Q V   |         |         |         |
    1+ 0       0.0815      1.15  |   Q V   |         |         |         |
    1+ 5       0.0909      1.36  |    Q V  |         |         |         |
    1+10       0.1009      1.45  |    Q  V |         |         |         |
    1+15       0.1109      1.45  |    Q   V|         |         |         |
    1+20       0.1203      1.37  |    Q    V         |         |         |
    1+25       0.1312      1.58  |     Q   |V        |         |         |
    1+30       0.1434      1.76  |      Q  | V       |         |         |
    1+35       0.1547      1.65  |     Q   |  V      |         |         |
    1+40       0.1666      1.72  |     Q   |   V     |         |         |
    1+45       0.1807      2.05  |       Q |    V    |         |         |
    1+50       0.1951      2.09  |       Q |     V   |         |         |
    1+55       0.2086      1.96  |      Q  |      V  |         |         |
    2+ 0       0.2221      1.96  |      Q  |       V |         |         |
    2+ 5       0.2361      2.03  |       Q |        V|         |         |
    2+10       0.2535      2.53  |         Q         |V        |         |
    2+15       0.2750      3.13  |         | Q       |  V      |         |
    2+20       0.2933      2.65  |         Q         |   V     |         |
    2+25       0.3210      4.03  |         |     Q   |      V  |         |
    2+30       0.3582      5.39  |         |         |Q       V|         |
    2+35       0.4030      6.51  |         |         |     Q   |  V      |
    2+40       0.4370      4.94  |         |        Q|         |     V   |
    2+45       0.4521      2.20  |       Q |         |         |       V |
    2+50       0.4606      1.23  |   Q     |         |         |       V |
    2+55       0.4688      1.19  |   Q     |         |         |        V|
    3+ 0       0.4734      0.67  | Q       |         |         |        V|
    3+ 5       0.4743      0.13  Q         |         |         |         V
  ------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRC00262.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
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Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	1.20	17.00

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	3.00	42.51

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 1.200(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.200(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
68.4	49.1	0.581	0.442	0.350	1.000	0.350
					Sum (F) =	0.350

Area averaged mean soil loss (F) (In/Hr) = 0.350
Minimum soil loss rate ((In/Hr)) = 0.175
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

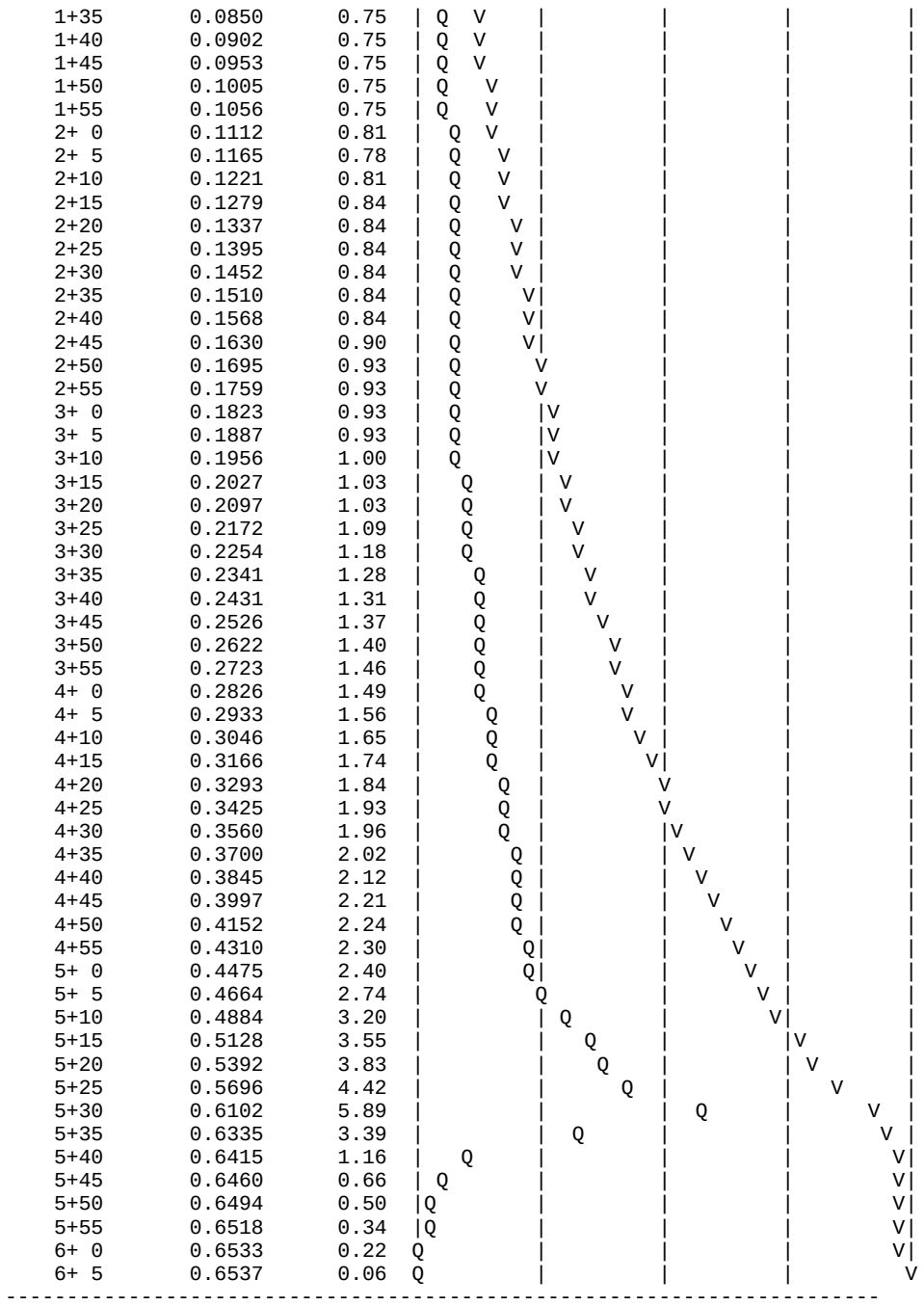
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	414.178	66.038	9.431
2	0.167	828.355	33.962	4.850
			Sum = 100.000	Sum= 14.281

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.072	(0.350)	0.039	0.033
2	0.17	0.60	0.086	(0.350)	0.047	0.039
3	0.25	0.60	0.086	(0.350)	0.047	0.039
4	0.33	0.60	0.086	(0.350)	0.047	0.039
5	0.42	0.60	0.086	(0.350)	0.047	0.039
6	0.50	0.70	0.101	(0.350)	0.055	0.046
7	0.58	0.70	0.101	(0.350)	0.055	0.046
8	0.67	0.70	0.101	(0.350)	0.055	0.046
9	0.75	0.70	0.101	(0.350)	0.055	0.046
10	0.83	0.70	0.101	(0.350)	0.055	0.046
11	0.92	0.70	0.101	(0.350)	0.055	0.046
12	1.00	0.80	0.115	(0.350)	0.063	0.052
13	1.08	0.80	0.115	(0.350)	0.063	0.052
14	1.17	0.80	0.115	(0.350)	0.063	0.052
15	1.25	0.80	0.115	(0.350)	0.063	0.052
16	1.33	0.80	0.115	(0.350)	0.063	0.052
17	1.42	0.80	0.115	(0.350)	0.063	0.052
18	1.50	0.80	0.115	(0.350)	0.063	0.052
19	1.58	0.80	0.115	(0.350)	0.063	0.052
20	1.67	0.80	0.115	(0.350)	0.063	0.052
21	1.75	0.80	0.115	(0.350)	0.063	0.052
22	1.83	0.80	0.115	(0.350)	0.063	0.052
23	1.92	0.80	0.115	(0.350)	0.063	0.052
24	2.00	0.90	0.130	(0.350)	0.071	0.059
25	2.08	0.80	0.115	(0.350)	0.063	0.052
26	2.17	0.90	0.130	(0.350)	0.071	0.059
27	2.25	0.90	0.130	(0.350)	0.071	0.059
28	2.33	0.90	0.130	(0.350)	0.071	0.059
29	2.42	0.90	0.130	(0.350)	0.071	0.059
30	2.50	0.90	0.130	(0.350)	0.071	0.059
31	2.58	0.90	0.130	(0.350)	0.071	0.059
32	2.67	0.90	0.130	(0.350)	0.071	0.059
33	2.75	1.00	0.144	(0.350)	0.079	0.065
34	2.83	1.00	0.144	(0.350)	0.079	0.065
35	2.92	1.00	0.144	(0.350)	0.079	0.065
36	3.00	1.00	0.144	(0.350)	0.079	0.065
37	3.08	1.00	0.144	(0.350)	0.079	0.065
38	3.17	1.10	0.158	(0.350)	0.087	0.072
39	3.25	1.10	0.158	(0.350)	0.087	0.072
40	3.33	1.10	0.158	(0.350)	0.087	0.072

```
41   3.42     1.20      0.173       (  0.350)       0.094        0.078
42   3.50     1.30      0.187       (  0.350)       0.102        0.085
43   3.58     1.40      0.202       (  0.350)       0.110        0.091
44   3.67     1.40      0.202       (  0.350)       0.110        0.091
45   3.75     1.50      0.216       (  0.350)       0.118        0.098
46   3.83     1.50      0.216       (  0.350)       0.118        0.098
47   3.92     1.60      0.230       (  0.350)       0.126        0.105
48   4.00     1.60      0.230       (  0.350)       0.126        0.105
49   4.08     1.70      0.245       (  0.350)       0.134        0.111
50   4.17     1.80      0.259       (  0.350)       0.142        0.118
51   4.25     1.90      0.274       (  0.350)       0.149        0.124
52   4.33     2.00      0.288       (  0.350)       0.157        0.131
53   4.42     2.10      0.302       (  0.350)       0.165        0.137
54   4.50     2.10      0.302       (  0.350)       0.165        0.137
55   4.58     2.20      0.317       (  0.350)       0.173        0.144
56   4.67     2.30      0.331       (  0.350)       0.181        0.150
57   4.75     2.40      0.346       (  0.350)       0.189        0.157
58   4.83     2.40      0.346       (  0.350)       0.189        0.157
59   4.92     2.50      0.360       (  0.350)       0.197        0.163
60   5.00     2.60      0.374       (  0.350)       0.205        0.170
61   5.08     3.10      0.446       (  0.350)       0.244        0.203
62   5.17     3.60      0.518       (  0.350)       0.283        0.235
63   5.25     3.90      0.562       (  0.350)       0.307        0.255
64   5.33     4.20      0.605       (  0.350)       0.330        0.274
65   5.42     4.70      0.677          0.350    (  0.370)       0.327
66   5.50     5.60      0.806          0.350    (  0.441)       0.457
67   5.58     1.90      0.274       (  0.350)       0.149        0.124
68   5.67     0.90      0.130       (  0.350)       0.071        0.059
69   5.75     0.60      0.086       (  0.350)       0.047        0.039
70   5.83     0.50      0.072       (  0.350)       0.039        0.033
71   5.92     0.30      0.043       (  0.350)       0.024        0.020
72   6.00     0.20      0.029       (  0.350)       0.016        0.013
             (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     6.6
      Flood volume = Effective rainfall      0.55(In)
       times area      14.2(Ac.)/[(In)/(Ft.)] =       0.7(Ac.Ft)
      Total soil loss =      0.65(In)
      Total soil loss =     0.763(Ac.Ft)
      Total rainfall =      1.20(In)
      Flood volume =       28475.9 Cubic Feet
      Total soil loss =       33245.7 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =      5.894(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------------
  0+ 5       0.0021      0.31  VQ        |         |         |         |
  0+10       0.0058      0.53  V Q       |         |         |         |
  0+15       0.0096      0.56  V Q       |         |         |         |
  0+20       0.0135      0.56  V Q       |         |         |         |
  0+25       0.0173      0.56  |VQ       |         |         |         |
  0+30       0.0216      0.62  |VQ       |         |         |         |
  0+35       0.0261      0.65  |VQ       |         |         |         |
  0+40       0.0306      0.65  |VQ       |         |         |         |
  0+45       0.0351      0.65  | Q       |         |         |         |
  0+50       0.0396      0.65  | Q       |         |         |         |
  0+55       0.0441      0.65  | Q       |         |         |         |
  1+ 0       0.0490      0.72  | QV      |         |         |         |
  1+ 5       0.0542      0.75  | QV      |         |         |         |
  1+10       0.0593      0.75  | QV      |         |         |         |
  1+15       0.0645      0.75  | QV      |         |         |         |
  1+20       0.0696      0.75  | Q V     |         |         |         |
  1+25       0.0748      0.75  | Q V     |         |         |         |
  1+30       0.0799      0.75  | Q V     |         |         |         |
```


1+35 0.0850 0.75
1+40 0.0902 0.75
1+45 0.0953 0.75
1+50 0.1005 0.75
1+55 0.1056 0.75
2+ 0 0.1112 0.81
2+ 5 0.1165 0.78
2+10 0.1221 0.81
2+15 0.1279 0.84
2+20 0.1337 0.84
2+25 0.1395 0.84
2+30 0.1452 0.84
2+35 0.1510 0.84
2+40 0.1568 0.84
2+45 0.1630 0.90
2+50 0.1695 0.93
2+55 0.1759 0.93
3+ 0 0.1823 0.93
3+ 5 0.1887 0.93
3+10 0.1956 1.00
3+15 0.2027 1.03
3+20 0.2097 1.03
3+25 0.2172 1.09
3+30 0.2254 1.18
3+35 0.2341 1.28
3+40 0.2431 1.31
3+45 0.2526 1.37
3+50 0.2622 1.40
3+55 0.2723 1.46
4+ 0 0.2826 1.49
4+ 5 0.2933 1.56
4+10 0.3046 1.65
4+15 0.3166 1.74
4+20 0.3293 1.84
4+25 0.3425 1.93
4+30 0.3560 1.96
4+35 0.3700 2.02
4+40 0.3845 2.12
4+45 0.3997 2.21
4+50 0.4152 2.24
4+55 0.4310 2.30
5+ 0 0.4475 2.40
5+ 5 0.4664 2.74
5+10 0.4884 3.20
5+15 0.5128 3.55
5+20 0.5392 3.83
5+25 0.5696 4.42
5+30 0.6102 5.89
5+35 0.6335 3.39
5+40 0.6415 1.16
5+45 0.6460 0.66
5+50 0.6494 0.50
5+55 0.6518 0.34
6+ 0 0.6533 0.22
6+ 5 0.6537 0.06

U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: PRC002242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR HOUR STORM
HUNSAKER & ASSOCIATES, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	2.00	28.34

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	5.00	70.85

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
68.4	49.1	0.581	0.442	0.350	1.000	0.350
					Sum (F) =	0.350

Area averaged mean soil loss (F) (In/Hr) = 0.350
Minimum soil loss rate ((In/Hr)) = 0.175
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	1242.533	100.000	14.281
		Sum = 100.000	Sum= 14.281

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.016	(0.618)	0.009	0.007
2	0.50	0.30	0.024	(0.611)	0.013	0.011
3	0.75	0.30	0.024	(0.603)	0.013	0.011
4	1.00	0.40	0.032	(0.596)	0.017	0.015
5	1.25	0.30	0.024	(0.589)	0.013	0.011
6	1.50	0.30	0.024	(0.582)	0.013	0.011
7	1.75	0.30	0.024	(0.575)	0.013	0.011
8	2.00	0.40	0.032	(0.568)	0.017	0.015
9	2.25	0.40	0.032	(0.562)	0.017	0.015
10	2.50	0.40	0.032	(0.555)	0.017	0.015
11	2.75	0.50	0.040	(0.548)	0.022	0.018
12	3.00	0.50	0.040	(0.541)	0.022	0.018
13	3.25	0.50	0.040	(0.535)	0.022	0.018
14	3.50	0.50	0.040	(0.528)	0.022	0.018
15	3.75	0.50	0.040	(0.521)	0.022	0.018
16	4.00	0.60	0.048	(0.515)	0.026	0.022
17	4.25	0.60	0.048	(0.508)	0.026	0.022
18	4.50	0.70	0.056	(0.502)	0.031	0.025
19	4.75	0.70	0.056	(0.495)	0.031	0.025
20	5.00	0.80	0.064	(0.489)	0.035	0.029
21	5.25	0.60	0.048	(0.483)	0.026	0.022
22	5.50	0.70	0.056	(0.476)	0.031	0.025
23	5.75	0.80	0.064	(0.470)	0.035	0.029
24	6.00	0.80	0.064	(0.464)	0.035	0.029
25	6.25	0.90	0.072	(0.458)	0.039	0.033
26	6.50	0.90	0.072	(0.452)	0.039	0.033
27	6.75	1.00	0.080	(0.446)	0.044	0.036
28	7.00	1.00	0.080	(0.440)	0.044	0.036
29	7.25	1.00	0.080	(0.434)	0.044	0.036
30	7.50	1.10	0.088	(0.428)	0.048	0.040
31	7.75	1.20	0.096	(0.422)	0.052	0.044
32	8.00	1.30	0.104	(0.416)	0.057	0.047
33	8.25	1.50	0.120	(0.410)	0.066	0.054
34	8.50	1.50	0.120	(0.404)	0.066	0.054
35	8.75	1.60	0.128	(0.399)	0.070	0.058
36	9.00	1.70	0.136	(0.393)	0.074	0.062
37	9.25	1.90	0.152	(0.388)	0.083	0.069
38	9.50	2.00	0.160	(0.382)	0.087	0.073
39	9.75	2.10	0.168	(0.377)	0.092	0.076
40	10.00	2.20	0.176	(0.371)	0.096	0.080
41	10.25	1.50	0.120	(0.366)	0.066	0.054

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42  10.50     1.50      0.120       (  0.361)       0.066        0.054
43  10.75     2.00      0.160       (  0.355)       0.087        0.073
44  11.00     2.00      0.160       (  0.350)       0.087        0.073
45  11.25     1.90      0.152       (  0.345)       0.083        0.069
46  11.50     1.90      0.152       (  0.340)       0.083        0.069
47  11.75     1.70      0.136       (  0.335)       0.074        0.062
48  12.00     1.80      0.144       (  0.330)       0.079        0.065
49  12.25     2.50      0.200       (  0.325)       0.109        0.091
50  12.50     2.60      0.208       (  0.320)       0.114        0.094
51  12.75     2.80      0.224       (  0.315)       0.122        0.102
52  13.00     2.90      0.232       (  0.311)       0.127        0.105
53  13.25     3.40      0.272       (  0.306)       0.149        0.123
54  13.50     3.40      0.272       (  0.301)       0.149        0.123
55  13.75     2.30      0.184       (  0.297)       0.101        0.083
56  14.00     2.30      0.184       (  0.292)       0.101        0.083
57  14.25     2.70      0.216       (  0.288)       0.118        0.098
58  14.50     2.60      0.208       (  0.283)       0.114        0.094
59  14.75     2.60      0.208       (  0.279)       0.114        0.094
60  15.00     2.50      0.200       (  0.275)       0.109        0.091
61  15.25     2.40      0.192       (  0.270)       0.105        0.087
62  15.50     2.30      0.184       (  0.266)       0.101        0.083
63  15.75     1.90      0.152       (  0.262)       0.083        0.069
64  16.00     1.90      0.152       (  0.258)       0.083        0.069
65  16.25     0.40      0.032       (  0.254)       0.017        0.015
66  16.50     0.40      0.032       (  0.250)       0.017        0.015
67  16.75     0.30      0.024       (  0.247)       0.013        0.011
68  17.00     0.30      0.024       (  0.243)       0.013        0.011
69  17.25     0.50      0.040       (  0.239)       0.022        0.018
70  17.50     0.50      0.040       (  0.236)       0.022        0.018
71  17.75     0.50      0.040       (  0.232)       0.022        0.018
72  18.00     0.40      0.032       (  0.229)       0.017        0.015
73  18.25     0.40      0.032       (  0.225)       0.017        0.015
74  18.50     0.40      0.032       (  0.222)       0.017        0.015
75  18.75     0.30      0.024       (  0.219)       0.013        0.011
76  19.00     0.20      0.016       (  0.216)       0.009        0.007
77  19.25     0.30      0.024       (  0.213)       0.013        0.011
78  19.50     0.40      0.032       (  0.210)       0.017        0.015
79  19.75     0.30      0.024       (  0.207)       0.013        0.011
80  20.00     0.20      0.016       (  0.204)       0.009        0.007
81  20.25     0.30      0.024       (  0.201)       0.013        0.011
82  20.50     0.30      0.024       (  0.199)       0.013        0.011
83  20.75     0.30      0.024       (  0.196)       0.013        0.011
84  21.00     0.20      0.016       (  0.194)       0.009        0.007
85  21.25     0.30      0.024       (  0.192)       0.013        0.011
86  21.50     0.20      0.016       (  0.189)       0.009        0.007
87  21.75     0.30      0.024       (  0.187)       0.013        0.011
88  22.00     0.20      0.016       (  0.185)       0.009        0.007
89  22.25     0.30      0.024       (  0.183)       0.013        0.011
90  22.50     0.20      0.016       (  0.182)       0.009        0.007
91  22.75     0.20      0.016       (  0.180)       0.009        0.007
92  23.00     0.20      0.016       (  0.179)       0.009        0.007
93  23.25     0.20      0.016       (  0.178)       0.009        0.007
94  23.50     0.20      0.016       (  0.176)       0.009        0.007
95  23.75     0.20      0.016       (  0.176)       0.009        0.007
96  24.00     0.20      0.016       (  0.175)       0.009        0.007
              (Loss Rate Not Used)
   Sum =     100.0                                   Sum =     3.6
     Flood volume = Effective rainfall      0.91(In)
      times area      14.2(Ac.)/[(In)/(Ft.)] =       1.1(Ac.Ft)
     Total soil loss =      1.09(In)
     Total soil loss =     1.290(Ac.Ft)
     Total rainfall =      2.00(In)
     Flood volume =       46670.7 Cubic Feet
     Total soil loss =       56200.7 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      1.763(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
```

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0021	0.10	Q	|	|	|	|
0+30	0.0054	0.16	Q	|	|	|	|
0+45	0.0086	0.16	Q	|	|	|	|
1+ 0	0.0129	0.21	Q	|	|	|	|
1+15	0.0161	0.16	Q	|	|	|	|
1+30	0.0193	0.16	Q	|	|	|	|
1+45	0.0225	0.16	Q	|	|	|	|
2+ 0	0.0268	0.21	QV	|	|	|	|
2+15	0.0311	0.21	QV	|	|	|	|
2+30	0.0354	0.21	QV	|	|	|	|
2+45	0.0407	0.26	|Q	|	|	|	|
3+ 0	0.0461	0.26	|Q	|	|	|	|
3+15	0.0514	0.26	|Q	|	|	|	|
3+30	0.0568	0.26	|QV	|	|	|	|
3+45	0.0621	0.26	|QV	|	|	|	|
4+ 0	0.0686	0.31	|QV	|	|	|	|
4+15	0.0750	0.31	|QV	|	|	|	|
4+30	0.0825	0.36	|Q V	|	|	|	|
4+45	0.0900	0.36	|Q V	|	|	|	|
5+ 0	0.0986	0.41	|Q V	|	|	|	|
5+15	0.1050	0.31	|Q V	|	|	|	|
5+30	0.1125	0.36	|Q V	|	|	|	|
5+45	0.1211	0.41	|Q V	|	|	|	|
6+ 0	0.1296	0.41	|Q V	|	|	|	|
6+15	0.1393	0.47	|Q V	|	|	|	|
6+30	0.1489	0.47	|Q V	|	|	|	|
6+45	0.1596	0.52	| Q V	|	|	|	|
7+ 0	0.1704	0.52	| Q V	|	|	|	|
7+15	0.1811	0.52	| Q V	|	|	|	|
7+30	0.1929	0.57	| Q V	|	|	|	|
7+45	0.2057	0.62	| Q V	|	|	|	|
8+ 0	0.2196	0.67	| Q V	|	|	|	|
8+15	0.2357	0.78	| Q V	|	|	|	|
8+30	0.2518	0.78	| Q V	|	|	|	|
8+45	0.2689	0.83	| Q V	|	|	|	|
9+ 0	0.2871	0.88	| Q V	|	|	|	|
9+15	0.3075	0.99	| Q V	|	|	|	|
9+30	0.3289	1.04	| Q V	|	|	|	|
9+45	0.3514	1.09	| Q V	|	|	|	|
10+ 0	0.3750	1.14	| Q V	|	|	|	|
10+15	0.3911	0.78	| Q V	|	|	|	|
10+30	0.4071	0.78	| Q V	|	|	|	|
10+45	0.4286	1.04	| Q V	|	|	|	|
11+ 0	0.4500	1.04	| Q V	|	|	|	|
11+15	0.4703	0.99	| Q V	|	|	|	|
11+30	0.4907	0.99	| Q V	|	|	|	|
11+45	0.5089	0.88	| Q V	|	|	|	|
12+ 0	0.5282	0.93	| Q V	|	|	|	|
12+15	0.5550	1.30	| Q V	|	|	|	|
12+30	0.5828	1.35	| Q V	|	|	|	|
12+45	0.6128	1.45	| Q V	|	|	|	|
13+ 0	0.6439	1.50	| Q V	|	|	|	|
13+15	0.6803	1.76	| Q V	|	|	|	|
13+30	0.7168	1.76	| Q V	|	|	|	|
13+45	0.7414	1.19	| Q V	|	|	|	|
14+ 0	0.7661	1.19	| Q V	|	|	|	|
14+15	0.7950	1.40	| Q V	|	|	|	|
14+30	0.8228	1.35	| Q V	|	|	|	|
14+45	0.8507	1.35	| Q V	|	|	|	|
15+ 0	0.8775	1.30	| Q V	|	|	|	|
15+15	0.9032	1.24	| Q V	|	|	|	|
15+30	0.9278	1.19	| Q V	|	|	|	|
15+45	0.9482	0.99	| Q V	|	|	|	|
16+ 0	0.9686	0.99	| Q V	|	|	|	|
16+15	0.9728	0.21	Q V	|	|	|	|
16+30	0.9771	0.21	Q V	|	|	|	|

```
   16+45       0.9803      0.16  Q         |         |         |     V   |
   17+ 0       0.9836      0.16  Q         |         |         |     V   |
   17+15       0.9889      0.26  |Q        |         |         |     V   |
   17+30       0.9943      0.26  |Q        |         |         |      V  |
   17+45       0.9996      0.26  |Q        |         |         |      V  |
   18+ 0       1.0039      0.21  Q         |         |         |      V  |
   18+15       1.0082      0.21  Q         |         |         |      V  |
   18+30       1.0125      0.21  Q         |         |         |      V  |
   18+45       1.0157      0.16  Q         |         |         |      V  |
   19+ 0       1.0178      0.10  Q         |         |         |       V |
   19+15       1.0211      0.16  Q         |         |         |       V |
   19+30       1.0253      0.21  Q         |         |         |       V |
   19+45       1.0286      0.16  Q         |         |         |       V |
   20+ 0       1.0307      0.10  Q         |         |         |       V |
   20+15       1.0339      0.16  Q         |         |         |       V |
   20+30       1.0371      0.16  Q         |         |         |       V |
   20+45       1.0403      0.16  Q         |         |         |       V |
   21+ 0       1.0425      0.10  Q         |         |         |       V |
   21+15       1.0457      0.16  Q         |         |         |        V|
   21+30       1.0478      0.10  Q         |         |         |        V|
   21+45       1.0511      0.16  Q         |         |         |        V|
   22+ 0       1.0532      0.10  Q         |         |         |        V|
   22+15       1.0564      0.16  Q         |         |         |        V|
   22+30       1.0586      0.10  Q         |         |         |        V|
   22+45       1.0607      0.10  Q         |         |         |        V|
   23+ 0       1.0628      0.10  Q         |         |         |        V|
   23+15       1.0650      0.10  Q         |         |         |        V|
   23+30       1.0671      0.10  Q         |         |         |        V|
   23+45       1.0693      0.10  Q         |         |         |        V|
   24+ 0       1.0714      0.10  Q         |         |         |         V
-------------------------------------------------------------------------
```

- Area 'C' – 10 Year - Post-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRC010110.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	0.55	7.79

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	1.30	18.42

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 0.859(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 0.858(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
68.4  68.4      0.379     0.442        0.228       1.000      0.228
                                                 Sum (F) =   0.228
Area averaged mean soil loss (F) (In/Hr) =  0.228
Minimum soil loss rate ((In/Hr)) =  0.114
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.546
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5200
------------------------------------------------------------------------

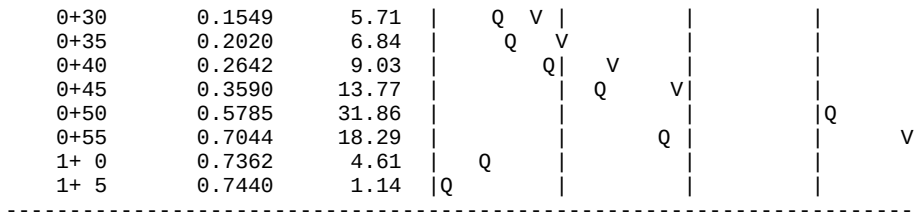
               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
---------------------------------------------------------------------
               Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
---------------------------------------------------------------------
    1   0.083        414.178         66.038             9.431
    2   0.167        828.355         33.962             4.850
                              Sum = 100.000   Sum=      14.281
---------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.10	0.422	0.228	(0.231)	0.194
2	0.17	4.60	0.474	0.228	(0.259)	0.245
3	0.25	4.50	0.464	0.228	(0.253)	0.235
4	0.33	4.90	0.505	0.228	(0.276)	0.276
5	0.42	5.50	0.567	0.228	(0.310)	0.338
6	0.50	6.40	0.659	0.228	(0.360)	0.431
7	0.58	7.10	0.731	0.228	(0.400)	0.503
8	0.67	9.00	0.927	0.228	(0.507)	0.699
9	0.75	12.90	1.329	0.228	(0.726)	1.101
10	0.83	29.50	3.039	0.228	(1.660)	2.811
11	0.92	7.00	0.721	0.228	(0.394)	0.493
12	1.00	4.50	0.464	0.228	(0.253)	0.235
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	7.6

```
   Flood volume = Effective rainfall      0.63(In)
    times area      14.2(Ac.)/[(In)/(Ft.)] =       0.7(Ac.Ft)
   Total soil loss =      0.23(In)
   Total soil loss =     0.270(Ac.Ft)
   Total rainfall =      0.86(In)
   Flood volume =       32409.4 Cubic Feet
   Total soil loss =       11746.6 Cubic Feet
   ---------------------------------------------------------------------
    Peak flow rate of this hydrograph =     31.859(CFS)
   ---------------------------------------------------------------------
   +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                     1 - H O U R    S T O R M
                  R u n o f f     H y d r o g r a p h
   ---------------------------------------------------------------------
              Hydrograph in   5   Minute intervals ((CFS))

   ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
---------------------------------------------------------------------
  0+ 5       0.0126      1.83  VQ        |         |         |         |
  0+10       0.0350      3.26  |V Q      |         |         |         |
  0+15       0.0585      3.41  |  Q      |         |         |         |
  0+20       0.0844      3.75  |  QV     |         |         |         |
  0+25       0.1156      4.53  |   Q V   |         |         |         |
```


0+30 0.1549 5.71
0+35 0.2020 6.84
0+40 0.2642 9.03
0+45 0.3590 13.77
0+50 0.5785 31.86
0+55 0.7044 18.29
1+ 0 0.7362 4.61
1+ 5 0.7440 1.14

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRC010310.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	0.85	12.04

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	2.00	28.34

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 1.323(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.323(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
68.4	68.4	0.379	0.442	0.228	1.000	0.228
					Sum (F) =	0.228

Area averaged mean soil loss (F) (In/Hr) = 0.228
Minimum soil loss rate ((In/Hr)) = 0.114
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	414.178	66.038	9.431
2	0.167	828.355	33.962	4.850
			Sum = 100.000	Sum= 14.281

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.206	(0.228)		0.113	0.094
2	0.17	1.30	0.206	(0.228)		0.113	0.094
3	0.25	1.10	0.175	(0.228)		0.095	0.079
4	0.33	1.50	0.238	(0.228)		0.130	0.108
5	0.42	1.50	0.238	(0.228)		0.130	0.108
6	0.50	1.80	0.286	(0.228)		0.156	0.130
7	0.58	1.50	0.238	(0.228)		0.130	0.108
8	0.67	1.80	0.286	(0.228)		0.156	0.130
9	0.75	1.80	0.286	(0.228)		0.156	0.130
10	0.83	1.50	0.238	(0.228)		0.130	0.108
11	0.92	1.60	0.254	(0.228)		0.139	0.115
12	1.00	1.80	0.286	(0.228)		0.156	0.130
13	1.08	2.20	0.349	(0.228)		0.191	0.158
14	1.17	2.20	0.349	(0.228)		0.191	0.158
15	1.25	2.20	0.349	(0.228)		0.191	0.158
16	1.33	2.00	0.318	(0.228)		0.173	0.144
17	1.42	2.60	0.413	(0.228)		0.226	0.187
18	1.50	2.70	0.429	0.228	(	0.234)	0.200
19	1.58	2.40	0.381	(0.228)		0.208	0.173
20	1.67	2.70	0.429	0.228	(	0.234)	0.200
21	1.75	3.30	0.524	0.228	(	0.286)	0.296
22	1.83	3.10	0.492	0.228	(	0.269)	0.264
23	1.92	2.90	0.460	0.228	(	0.252)	0.232
24	2.00	3.00	0.476	0.228	(	0.260)	0.248
25	2.08	3.10	0.492	0.228	(	0.269)	0.264
26	2.17	4.20	0.667	0.228	(	0.364)	0.438
27	2.25	5.00	0.794	0.228	(	0.434)	0.565
28	2.33	3.50	0.556	0.228	(	0.304)	0.327
29	2.42	6.80	1.080	0.228	(	0.590)	0.851
30	2.50	7.30	1.159	0.228	(	0.633)	0.931
31	2.58	8.20	1.302	0.228	(	0.711)	1.074
32	2.67	5.90	0.937	0.228	(	0.512)	0.708
33	2.75	2.00	0.318	(0.228)		0.173	0.144
34	2.83	1.80	0.286	(0.228)		0.156	0.130
35	2.92	1.80	0.286	(0.228)		0.156	0.130
36	3.00	0.60	0.095	(0.228)		0.052	0.043
		(Loss Rate Not Used)					
Sum =		100.0				Sum =	9.4

Flood volume = Effective rainfall 0.78(In)
times area 14.2(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)

```
      Total soil loss =      0.54(In)
      Total soil loss =     0.642(Ac.Ft)
      Total rainfall =      1.32(In)
      Flood volume =       40109.3 Cubic Feet
      Total soil loss =       27943.9 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     14.645(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
  ---------------------------------------------------------------------------
    0+ 5       0.0061      0.88  VQ        |         |         |         |
    0+10       0.0153      1.34  V Q       |         |         |         |
    0+15       0.0236      1.20  |VQ       |         |         |         |
    0+20       0.0332      1.40  |VQ       |         |         |         |
    0+25       0.0439      1.54  |V Q      |         |         |         |
    0+30       0.0559      1.75  | VQ      |         |         |         |
    0+35       0.0673      1.65  | VQ      |         |         |         |
    0+40       0.0793      1.75  |  Q      |         |         |         |
    0+45       0.0921      1.85  |  Q      |         |         |         |
    0+50       0.1034      1.65  |  QV     |         |         |         |
    0+55       0.1145      1.61  |  QV     |         |         |         |
    1+ 0       0.1268      1.78  |  Q V    |         |         |         |
    1+ 5       0.1414      2.12  |   Q V   |         |         |         |
    1+10       0.1570      2.26  |   Q V   |         |         |         |
    1+15       0.1726      2.26  |   Q  V  |         |         |         |
    1+20       0.1873      2.13  |   Q   V |         |         |         |
    1+25       0.2042      2.47  |   Q   V |         |         |         |
    1+30       0.2235      2.80  |    Q   V|         |         |         |
    1+35       0.2415      2.60  |    Q    V         |         |         |
    1+40       0.2602      2.73  |    Q    |V        |         |         |
    1+45       0.2861      3.76  |      Q  | V       |         |         |
    1+50       0.3132      3.92  |      Q  |  V      |         |         |
    1+55       0.3371      3.47  |     Q   |   V     |         |         |
    2+ 0       0.3609      3.47  |     Q   |    V    |         |         |
    2+ 5       0.3864      3.69  |      Q  |     V   |         |         |
    2+10       0.4237      5.42  |         Q       V |         |         |
    2+15       0.4751      7.46  |         |   Q     V         |         |
    2+20       0.5152      5.83  |         |Q        | V       |         |
    2+25       0.5815      9.62  |         |         Q|    V    |         |
    2+30       0.6704     12.91  |         |          |    Q   V|         |
    2+35       0.7713     14.64  |         |          |        Q|  V      |
    2+40       0.8532     11.89  |         |          |  Q      |      V  |
    2+45       0.8862      4.80  |         Q|         |         |       V |
    2+50       0.8994      1.92  |  Q      |         |         |        V|
    2+55       0.9122      1.85  |  Q      |         |         |        V|
    3+ 0       0.9193      1.04  | Q       |         |         |        V|
    3+ 5       0.9208      0.21  Q         |         |         |        V|
  ---------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRC010610.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	1.20	17.00

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	3.00	42.51

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 1.941(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.940(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
68.4	68.4	0.379	0.442	0.228	1.000	0.228
					Sum (F) =	0.228

Area averaged mean soil loss (F) (In/Hr) = 0.228
Minimum soil loss rate ((In/Hr)) = 0.114
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	414.178	66.038	9.431
2	0.167	828.355	33.962	4.850
			Sum = 100.000	Sum= 14.281

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.116	(0.228)		0.064	0.053
2	0.17	0.60	0.140	(0.228)		0.076	0.063
3	0.25	0.60	0.140	(0.228)		0.076	0.063
4	0.33	0.60	0.140	(0.228)		0.076	0.063
5	0.42	0.60	0.140	(0.228)		0.076	0.063
6	0.50	0.70	0.163	(0.228)		0.089	0.074
7	0.58	0.70	0.163	(0.228)		0.089	0.074
8	0.67	0.70	0.163	(0.228)		0.089	0.074
9	0.75	0.70	0.163	(0.228)		0.089	0.074
10	0.83	0.70	0.163	(0.228)		0.089	0.074
11	0.92	0.70	0.163	(0.228)		0.089	0.074
12	1.00	0.80	0.186	(0.228)		0.102	0.085
13	1.08	0.80	0.186	(0.228)		0.102	0.085
14	1.17	0.80	0.186	(0.228)		0.102	0.085
15	1.25	0.80	0.186	(0.228)		0.102	0.085
16	1.33	0.80	0.186	(0.228)		0.102	0.085
17	1.42	0.80	0.186	(0.228)		0.102	0.085
18	1.50	0.80	0.186	(0.228)		0.102	0.085
19	1.58	0.80	0.186	(0.228)		0.102	0.085
20	1.67	0.80	0.186	(0.228)		0.102	0.085
21	1.75	0.80	0.186	(0.228)		0.102	0.085
22	1.83	0.80	0.186	(0.228)		0.102	0.085
23	1.92	0.80	0.186	(0.228)		0.102	0.085
24	2.00	0.90	0.210	(0.228)		0.114	0.095
25	2.08	0.80	0.186	(0.228)		0.102	0.085
26	2.17	0.90	0.210	(0.228)		0.114	0.095
27	2.25	0.90	0.210	(0.228)		0.114	0.095
28	2.33	0.90	0.210	(0.228)		0.114	0.095
29	2.42	0.90	0.210	(0.228)		0.114	0.095
30	2.50	0.90	0.210	(0.228)		0.114	0.095
31	2.58	0.90	0.210	(0.228)		0.114	0.095
32	2.67	0.90	0.210	(0.228)		0.114	0.095
33	2.75	1.00	0.233	(0.228)		0.127	0.106
34	2.83	1.00	0.233	(0.228)		0.127	0.106
35	2.92	1.00	0.233	(0.228)		0.127	0.106
36	3.00	1.00	0.233	(0.228)		0.127	0.106
37	3.08	1.00	0.233	(0.228)		0.127	0.106
38	3.17	1.10	0.256	(0.228)		0.140	0.116
39	3.25	1.10	0.256	(0.228)		0.140	0.116
40	3.33	1.10	0.256	(0.228)		0.140	0.116

```
41   3.42     1.20      0.279       (  0.228)       0.153        0.127
42   3.50     1.30      0.303       (  0.228)       0.165        0.137
43   3.58     1.40      0.326       (  0.228)       0.178        0.148
44   3.67     1.40      0.326       (  0.228)       0.178        0.148
45   3.75     1.50      0.349       (  0.228)       0.191        0.158
46   3.83     1.50      0.349       (  0.228)       0.191        0.158
47   3.92     1.60      0.373       (  0.228)       0.204        0.169
48   4.00     1.60      0.373       (  0.228)       0.204        0.169
49   4.08     1.70      0.396       (  0.228)       0.216        0.180
50   4.17     1.80      0.419          0.228    (  0.229)       0.191
51   4.25     1.90      0.442          0.228    (  0.242)       0.214
52   4.33     2.00      0.466          0.228    (  0.254)       0.237
53   4.42     2.10      0.489          0.228    (  0.267)       0.261
54   4.50     2.10      0.489          0.228    (  0.267)       0.261
55   4.58     2.20      0.512          0.228    (  0.280)       0.284
56   4.67     2.30      0.536          0.228    (  0.293)       0.307
57   4.75     2.40      0.559          0.228    (  0.305)       0.330
58   4.83     2.40      0.559          0.228    (  0.305)       0.330
59   4.92     2.50      0.582          0.228    (  0.318)       0.354
60   5.00     2.60      0.605          0.228    (  0.331)       0.377
61   5.08     3.10      0.722          0.228    (  0.394)       0.493
62   5.17     3.60      0.838          0.228    (  0.458)       0.610
63   5.25     3.90      0.908          0.228    (  0.496)       0.680
64   5.33     4.20      0.978          0.228    (  0.534)       0.750
65   5.42     4.70      1.094          0.228    (  0.598)       0.866
66   5.50     5.60      1.304          0.228    (  0.712)       1.076
67   5.58     1.90      0.442          0.228    (  0.242)       0.214
68   5.67     0.90      0.210       (  0.228)       0.114        0.095
69   5.75     0.60      0.140       (  0.228)       0.076        0.063
70   5.83     0.50      0.116       (  0.228)       0.064        0.053
71   5.92     0.30      0.070       (  0.228)       0.038        0.032
72   6.00     0.20      0.047       (  0.228)       0.025        0.021
             (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    13.0
      Flood volume = Effective rainfall      1.08(In)
       times area      14.2(Ac.)/[(In)/(Ft.)] =       1.3(Ac.Ft)
      Total soil loss =      0.86(In)
      Total soil loss =     1.014(Ac.Ft)
      Total rainfall =      1.94(In)
      Flood volume =       55635.3 Cubic Feet
      Total soil loss =       44175.3 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     14.351(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-------------------------------------------------------------------------
  0+ 5       0.0034      0.50  Q         |         |         |         |
  0+10       0.0093      0.85  VQ        |         |         |         |
  0+15       0.0156      0.91  VQ        |         |         |         |
  0+20       0.0218      0.91  VQ        |         |         |         |
  0+25       0.0280      0.91  VQ        |         |         |         |
  0+30       0.0350      1.01  |VQ       |         |         |         |
  0+35       0.0422      1.06  |VQ       |         |         |         |
  0+40       0.0495      1.06  |VQ       |         |         |         |
  0+45       0.0568      1.06  |VQ       |         |         |         |
  0+50       0.0641      1.06  | Q       |         |         |         |
  0+55       0.0713      1.06  | Q       |         |         |         |
  1+ 0       0.0793      1.16  | Q       |         |         |         |
  1+ 5       0.0876      1.21  | Q       |         |         |         |
  1+10       0.0959      1.21  | QV      |         |         |         |
  1+15       0.1042      1.21  | QV      |         |         |         |
  1+20       0.1126      1.21  | QV      |         |         |         |
  1+25       0.1209      1.21  | QV      |         |         |         |
  1+30       0.1292      1.21  | Q V     |         |         |         |
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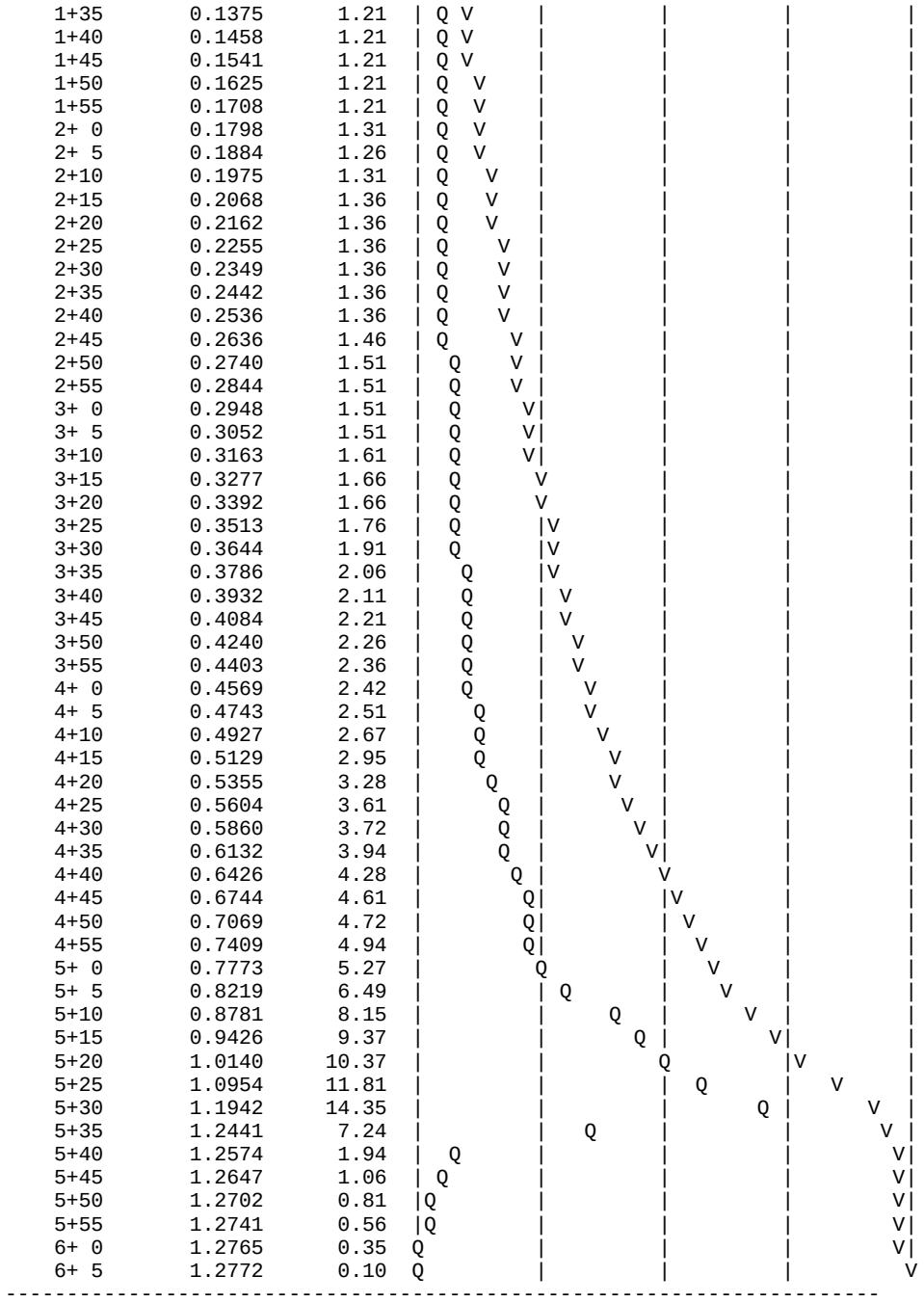

U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: PRC0102410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR HOUR STORM
HUNSAKER & ASSOCIATES, BRIAN LOWELL, PE

Drainage Area =   14.17(Ac.) =   0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =   14.17(Ac.) =   0.022 Sq. Mi.
Length along longest watercourse =   1178.00(Ft.)
Length along longest watercourse measured to centroid =   347.00(Ft.)
Length along longest watercourse =   0.223 Mi.
Length along longest watercourse measured to centroid =   0.066 Mi.
Difference in elevation =   187.90(Ft.)
Slope along watercourse =   842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time =   0.020 Hr.
Lag time =   1.21 Min.
25% of lag time =   0.30 Min.
40% of lag time =   0.48 Min.
Unit time =   15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =   0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]   Rainfall(In)[2]   Weighting[1*2]
       14.17   2.00   28.34

100 YEAR Area rainfall data:

Area(Ac.)[1]   Rainfall(In)[2]   Weighting[1*2]
       14.17   5.00   70.85

STORM EVENT (YEAR) =   10.00
Area Averaged 2-Year Rainfall =   2.000(In)
Area Averaged 100-Year Rainfall =   5.000(In)

Point rain (area averaged) =   3.234(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain =   3.234(In)

Sub-Area Data:
Area(Ac.)   Runoff Index   Impervious %
    14.170   68.40   0.442
 Total Area Entered =   14.17(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
68.4	68.4	0.379	0.442	0.228	1.000	0.228
					Sum (F) =	0.228

Area averaged mean soil loss (F) (In/Hr) = 0.228
Minimum soil loss rate ((In/Hr)) = 0.114
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	1242.533	100.000	14.281
		Sum =	100.000 Sum=	14.281

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.026	(0.403)	0.014	0.012
2	0.50	0.30	0.039	(0.399)	0.021	0.018
3	0.75	0.30	0.039	(0.394)	0.021	0.018
4	1.00	0.40	0.052	(0.389)	0.028	0.023
5	1.25	0.30	0.039	(0.385)	0.021	0.018
6	1.50	0.30	0.039	(0.380)	0.021	0.018
7	1.75	0.30	0.039	(0.376)	0.021	0.018
8	2.00	0.40	0.052	(0.371)	0.028	0.023
9	2.25	0.40	0.052	(0.367)	0.028	0.023
10	2.50	0.40	0.052	(0.362)	0.028	0.023
11	2.75	0.50	0.065	(0.358)	0.035	0.029
12	3.00	0.50	0.065	(0.353)	0.035	0.029
13	3.25	0.50	0.065	(0.349)	0.035	0.029
14	3.50	0.50	0.065	(0.345)	0.035	0.029
15	3.75	0.50	0.065	(0.340)	0.035	0.029
16	4.00	0.60	0.078	(0.336)	0.042	0.035
17	4.25	0.60	0.078	(0.332)	0.042	0.035
18	4.50	0.70	0.091	(0.328)	0.049	0.041
19	4.75	0.70	0.091	(0.323)	0.049	0.041
20	5.00	0.80	0.103	(0.319)	0.057	0.047
21	5.25	0.60	0.078	(0.315)	0.042	0.035
22	5.50	0.70	0.091	(0.311)	0.049	0.041
23	5.75	0.80	0.103	(0.307)	0.057	0.047
24	6.00	0.80	0.103	(0.303)	0.057	0.047
25	6.25	0.90	0.116	(0.299)	0.064	0.053
26	6.50	0.90	0.116	(0.295)	0.064	0.053
27	6.75	1.00	0.129	(0.291)	0.071	0.059
28	7.00	1.00	0.129	(0.287)	0.071	0.059
29	7.25	1.00	0.129	(0.283)	0.071	0.059
30	7.50	1.10	0.142	(0.279)	0.078	0.065
31	7.75	1.20	0.155	(0.275)	0.085	0.070
32	8.00	1.30	0.168	(0.272)	0.092	0.076
33	8.25	1.50	0.194	(0.268)	0.106	0.088
34	8.50	1.50	0.194	(0.264)	0.106	0.088
35	8.75	1.60	0.207	(0.260)	0.113	0.094
36	9.00	1.70	0.220	(0.257)	0.120	0.100
37	9.25	1.90	0.246	(0.253)	0.134	0.112
38	9.50	2.00	0.259	(0.249)	0.141	0.117
39	9.75	2.10	0.272	(0.246)	0.148	0.123
40	10.00	2.20	0.285	(0.242)	0.155	0.129
41	10.25	1.50	0.194	(0.239)	0.106	0.088

```
42  10.50     1.50      0.194       (  0.235)       0.106        0.088
43  10.75     2.00      0.259       (  0.232)       0.141        0.117
44  11.00     2.00      0.259       (  0.229)       0.141        0.117
45  11.25     1.90      0.246       (  0.225)       0.134        0.112
46  11.50     1.90      0.246       (  0.222)       0.134        0.112
47  11.75     1.70      0.220       (  0.219)       0.120        0.100
48  12.00     1.80      0.233       (  0.215)       0.127        0.106
49  12.25     2.50      0.323       (  0.212)       0.177        0.147
50  12.50     2.60      0.336       (  0.209)       0.184        0.153
51  12.75     2.80      0.362       (  0.206)       0.198        0.164
52  13.00     2.90      0.375          0.203    (  0.205)       0.172
53  13.25     3.40      0.440          0.200    (  0.240)       0.240
54  13.50     3.40      0.440          0.197    (  0.240)       0.243
55  13.75     2.30      0.298       (  0.194)       0.163        0.135
56  14.00     2.30      0.298       (  0.191)       0.163        0.135
57  14.25     2.70      0.349          0.188    (  0.191)       0.162
58  14.50     2.60      0.336       (  0.185)       0.184        0.153
59  14.75     2.60      0.336          0.182    (  0.184)       0.154
60  15.00     2.50      0.323       (  0.179)       0.177        0.147
61  15.25     2.40      0.310       (  0.177)       0.170        0.141
62  15.50     2.30      0.298       (  0.174)       0.163        0.135
63  15.75     1.90      0.246       (  0.171)       0.134        0.112
64  16.00     1.90      0.246       (  0.169)       0.134        0.112
65  16.25     0.40      0.052       (  0.166)       0.028        0.023
66  16.50     0.40      0.052       (  0.163)       0.028        0.023
67  16.75     0.30      0.039       (  0.161)       0.021        0.018
68  17.00     0.30      0.039       (  0.159)       0.021        0.018
69  17.25     0.50      0.065       (  0.156)       0.035        0.029
70  17.50     0.50      0.065       (  0.154)       0.035        0.029
71  17.75     0.50      0.065       (  0.152)       0.035        0.029
72  18.00     0.40      0.052       (  0.149)       0.028        0.023
73  18.25     0.40      0.052       (  0.147)       0.028        0.023
74  18.50     0.40      0.052       (  0.145)       0.028        0.023
75  18.75     0.30      0.039       (  0.143)       0.021        0.018
76  19.00     0.20      0.026       (  0.141)       0.014        0.012
77  19.25     0.30      0.039       (  0.139)       0.021        0.018
78  19.50     0.40      0.052       (  0.137)       0.028        0.023
79  19.75     0.30      0.039       (  0.135)       0.021        0.018
80  20.00     0.20      0.026       (  0.133)       0.014        0.012
81  20.25     0.30      0.039       (  0.131)       0.021        0.018
82  20.50     0.30      0.039       (  0.130)       0.021        0.018
83  20.75     0.30      0.039       (  0.128)       0.021        0.018
84  21.00     0.20      0.026       (  0.127)       0.014        0.012
85  21.25     0.30      0.039       (  0.125)       0.021        0.018
86  21.50     0.20      0.026       (  0.124)       0.014        0.012
87  21.75     0.30      0.039       (  0.122)       0.021        0.018
88  22.00     0.20      0.026       (  0.121)       0.014        0.012
89  22.25     0.30      0.039       (  0.120)       0.021        0.018
90  22.50     0.20      0.026       (  0.119)       0.014        0.012
91  22.75     0.20      0.026       (  0.118)       0.014        0.012
92  23.00     0.20      0.026       (  0.117)       0.014        0.012
93  23.25     0.20      0.026       (  0.116)       0.014        0.012
94  23.50     0.20      0.026       (  0.115)       0.014        0.012
95  23.75     0.20      0.026       (  0.115)       0.014        0.012
96  24.00     0.20      0.026       (  0.114)       0.014        0.012
              (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     6.0
     Flood volume = Effective rainfall      1.49(In)
      times area      14.2(Ac.)/[(In)/(Ft.)] =       1.8(Ac.Ft)
     Total soil loss =      1.74(In)
     Total soil loss =     2.059(Ac.Ft)
     Total rainfall =      3.23(In)
     Flood volume =       76646.7 Cubic Feet
     Total soil loss =       89707.8 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      3.475(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
     ---------------------------------------------------------------------
```

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0035	0.17	Q	|	|	|	|
0+30	0.0087	0.25	VQ	|	|	|	|
0+45	0.0139	0.25	VQ	|	|	|	|
1+ 0	0.0208	0.34	VQ	|	|	|	|
1+15	0.0260	0.25	VQ	|	|	|	|
1+30	0.0312	0.25	VQ	|	|	|	|
1+45	0.0364	0.25	VQ	|	|	|	|
2+ 0	0.0433	0.34	VQ	|	|	|	|
2+15	0.0502	0.34	|Q	|	|	|	|
2+30	0.0572	0.34	|Q	|	|	|	|
2+45	0.0658	0.42	|Q	|	|	|	|
3+ 0	0.0745	0.42	|Q	|	|	|	|
3+15	0.0832	0.42	|Q	|	|	|	|
3+30	0.0918	0.42	|QV	|	|	|	|
3+45	0.1005	0.42	|QV	|	|	|	|
4+ 0	0.1109	0.50	| Q	|	|	|	|
4+15	0.1213	0.50	| Q	|	|	|	|
4+30	0.1334	0.59	| QV	|	|	|	|
4+45	0.1455	0.59	| QV	|	|	|	|
5+ 0	0.1594	0.67	| QV	|	|	|	|
5+15	0.1698	0.50	| QV	|	|	|	|
5+30	0.1819	0.59	| Q V	|	|	|	|
5+45	0.1958	0.67	| Q V	|	|	|	|
6+ 0	0.2096	0.67	| Q V	|	|	|	|
6+15	0.2252	0.75	| Q V	|	|	|	|
6+30	0.2408	0.75	| Q V	|	|	|	|
6+45	0.2582	0.84	| Q V	|	|	|	|
7+ 0	0.2755	0.84	| Q V	|	|	|	|
7+15	0.2928	0.84	| Q V	|	|	|	|
7+30	0.3119	0.92	| Q V	|	|	|	|
7+45	0.3327	1.01	| Q V	|	|	|	|
8+ 0	0.3552	1.09	| Q V	|	|	|	|
8+15	0.3812	1.26	| Q V	|	|	|	|
8+30	0.4072	1.26	| Q V|	|	|	|	|
8+45	0.4349	1.34	| Q V|	|	|	|	|
9+ 0	0.4643	1.43	| Q V	|	|	|	|
9+15	0.4973	1.59	| Q V	|	|	|	|
9+30	0.5319	1.68	| Q | V	|	|	|	|
9+45	0.5683	1.76	| Q | V	|	|	|	|
10+ 0	0.6064	1.84	| Q | V	|	|	|	|
10+15	0.6324	1.26	| Q | V	|	|	|	|
10+30	0.6584	1.26	| Q | V	|	|	|	|
10+45	0.6930	1.68	| Q | V	|	|	|	|
11+ 0	0.7277	1.68	| Q | V	|	|	|	|
11+15	0.7606	1.59	| Q | V	|	|	|	|
11+30	0.7935	1.59	| Q | V	|	|	|	|
11+45	0.8230	1.43	| Q | V	|	|	|	|
12+ 0	0.8542	1.51	| Q | V|	|	|	|	|
12+15	0.8975	2.10	| Q | V	|	|	|	|
12+30	0.9425	2.18	| Q | V	|	|	|	|
12+45	0.9910	2.35	| Q| V	|	|	|	|
13+ 0	1.0420	2.46	| Q| V	|	|	|	|
13+15	1.1129	3.43	| | Q V	|	|	|	|
13+30	1.1847	3.48	| | Q V	|	|	|	|
13+45	1.2245	1.93	| Q | V	|	|	|	|
14+ 0	1.2644	1.93	| Q | V	|	|	|	|
14+15	1.3121	2.31	| Q| V	|	|	|	|
14+30	1.3571	2.18	| Q | V	|	|	|	|
14+45	1.4027	2.20	| Q | V	|	|	|	|
15+ 0	1.4460	2.10	| Q | V	|	|	|	|
15+15	1.4875	2.01	| Q | V	|	|	|	|
15+30	1.5274	1.93	| Q | V	|	|	|	|
15+45	1.5603	1.59	| Q | V	|	|	|	|
16+ 0	1.5932	1.59	| Q | V	|	|	|	|
16+15	1.6002	0.34	|Q | V	|	|	|	|
16+30	1.6071	0.34	|Q | V	|	|	|	|

```
   16+45       1.6123      0.25  |Q        |         |         |     V   |
   17+ 0       1.6175      0.25  |Q        |         |         |     V   |
   17+15       1.6262      0.42  |Q        |         |         |     V   |
   17+30       1.6348      0.42  |Q        |         |         |      V  |
   17+45       1.6435      0.42  |Q        |         |         |      V  |
   18+ 0       1.6504      0.34  |Q        |         |         |      V  |
   18+15       1.6573      0.34  |Q        |         |         |      V  |
   18+30       1.6643      0.34  |Q        |         |         |      V  |
   18+45       1.6695      0.25  |Q        |         |         |      V  |
   19+ 0       1.6729      0.17  Q         |         |         |       V |
   19+15       1.6781      0.25  |Q        |         |         |       V |
   19+30       1.6851      0.34  |Q        |         |         |       V |
   19+45       1.6903      0.25  |Q        |         |         |       V |
   20+ 0       1.6937      0.17  Q         |         |         |       V |
   20+15       1.6989      0.25  |Q        |         |         |       V |
   20+30       1.7041      0.25  |Q        |         |         |       V |
   20+45       1.7093      0.25  |Q        |         |         |       V |
   21+ 0       1.7128      0.17  Q         |         |         |       V |
   21+15       1.7180      0.25  |Q        |         |         |        V|
   21+30       1.7214      0.17  Q         |         |         |        V|
   21+45       1.7266      0.25  |Q        |         |         |        V|
   22+ 0       1.7301      0.17  Q         |         |         |        V|
   22+15       1.7353      0.25  |Q        |         |         |        V|
   22+30       1.7388      0.17  Q         |         |         |        V|
   22+45       1.7422      0.17  Q         |         |         |        V|
   23+ 0       1.7457      0.17  Q         |         |         |        V|
   23+15       1.7492      0.17  Q         |         |         |        V|
   23+30       1.7526      0.17  Q         |         |         |        V|
   23+45       1.7561      0.17  Q         |         |         |        V|
   24+ 0       1.7596      0.17  Q         |         |         |        V|
-------------------------------------------------------------------------
```

- Area 'C' – 100 Year - Post-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRC1001100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	0.55	7.79

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	1.30	18.42

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 1.300(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.300(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

```
      RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
      AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
      68.4  84.0      0.198     0.442        0.119       1.000      0.119
                                                       Sum (F) =   0.119
      Area averaged mean soil loss (F) (In/Hr) =  0.119
      Minimum soil loss rate ((In/Hr)) =  0.060
      (for 24 hour storm duration)
      Soil low loss rate (decimal) =   0.546
      ------------------------------------------------------------------------
      Slope of intensity-duration curve for a 1 hour storm =0.5200
      ------------------------------------------------------------------------

                  U n i t  H y d r o g r a p h
                         VALLEY S-Curve
      ------------------------------------------------------------------
                  Unit Hydrograph Data
      ------------------------------------------------------------------
      Unit time period   Time % of lag   Distribution   Unit Hydrograph
          (hrs)                          Graph %           (CFS)
      ------------------------------------------------------------------
          1   0.083        414.178         66.038             9.431
          2   0.167        828.355         33.962             4.850
                                  Sum = 100.000   Sum=      14.281
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.10	0.640	0.119	(0.349)	0.520
2	0.17	4.60	0.718	0.119	(0.392)	0.598
3	0.25	4.50	0.702	0.119	(0.383)	0.583
4	0.33	4.90	0.764	0.119	(0.418)	0.645
5	0.42	5.50	0.858	0.119	(0.469)	0.739
6	0.50	6.40	0.998	0.119	(0.545)	0.879
7	0.58	7.10	1.107	0.119	(0.605)	0.988
8	0.67	9.00	1.404	0.119	(0.767)	1.285
9	0.75	12.90	2.012	0.119	(1.099)	1.893
10	0.83	29.50	4.601	0.119	(2.514)	4.482
11	0.92	7.00	1.092	0.119	(0.597)	0.973
12	1.00	4.50	0.702	0.119	(0.383)	0.583
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	14.2

```
      Flood volume = Effective rainfall      1.18(In)
       times area      14.2(Ac.)/[(In)/(Ft.)] =       1.4(Ac.Ft)
      Total soil loss =      0.12(In)
      Total soil loss =     0.141(Ac.Ft)
      Total rainfall =      1.30(In)
      Flood volume =       60729.2 Cubic Feet
      Total soil loss =        6130.5 Cubic Feet
      ------------------------------------------------------------------
       Peak flow rate of this hydrograph =     51.478(CFS)
      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        1 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

      ------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
 ----------------------------------------------------------------------
   0+ 5       0.0338      4.91  V  Q      |         |         |         |
   0+10       0.0901      8.17  | V  Q    |         |         |         |
   0+15       0.1479      8.40  |   VQ    |         |         |         |
   0+20       0.2093      8.91  |    QV   |         |         |         |
   0+25       0.2789     10.10  |     Q V |         |         |         |
```

```
    0+30       0.3607     11.88  |      Q  V         |         |         |
    0+35       0.4543     13.59  |        Q|  V      |         |         |
    0+40       0.5708     16.92  |         |Q    V   |         |         |
    0+45       0.7368     24.09  |         |     Q   |V        |         |
    0+50       1.0913     51.48  |         |         |         |V  Q     |
    0+55       1.3043     30.93  |         |         Q         |      V  |
    1+ 0       1.3747     10.22  |     Q   |         |         |        V|
    1+ 5       1.3941      2.83  |Q        |         |         |         V
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRC1003100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	0.85	12.04

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	2.00	28.34

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
68.4	84.0	0.198	0.442	0.119	1.000	0.119
					Sum (F) =	0.119

Area averaged mean soil loss (F) (In/Hr) = 0.119
Minimum soil loss rate ((In/Hr)) = 0.060
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	414.178	66.038	9.431
2	0.167	828.355	33.962	4.850
			Sum = 100.000	Sum= 14.281

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.312	0.119	(0.170)	0.193
2	0.17	1.30	0.312	0.119	(0.170)	0.193
3	0.25	1.10	0.264	0.119	(0.144)	0.145
4	0.33	1.50	0.360	0.119	(0.197)	0.241
5	0.42	1.50	0.360	0.119	(0.197)	0.241
6	0.50	1.80	0.432	0.119	(0.236)	0.313
7	0.58	1.50	0.360	0.119	(0.197)	0.241
8	0.67	1.80	0.432	0.119	(0.236)	0.313
9	0.75	1.80	0.432	0.119	(0.236)	0.313
10	0.83	1.50	0.360	0.119	(0.197)	0.241
11	0.92	1.60	0.384	0.119	(0.210)	0.265
12	1.00	1.80	0.432	0.119	(0.236)	0.313
13	1.08	2.20	0.528	0.119	(0.288)	0.409
14	1.17	2.20	0.528	0.119	(0.288)	0.409
15	1.25	2.20	0.528	0.119	(0.288)	0.409
16	1.33	2.00	0.480	0.119	(0.262)	0.361
17	1.42	2.60	0.624	0.119	(0.341)	0.505
18	1.50	2.70	0.648	0.119	(0.354)	0.529
19	1.58	2.40	0.576	0.119	(0.315)	0.457
20	1.67	2.70	0.648	0.119	(0.354)	0.529
21	1.75	3.30	0.792	0.119	(0.433)	0.673
22	1.83	3.10	0.744	0.119	(0.406)	0.625
23	1.92	2.90	0.696	0.119	(0.380)	0.577
24	2.00	3.00	0.720	0.119	(0.393)	0.601
25	2.08	3.10	0.744	0.119	(0.406)	0.625
26	2.17	4.20	1.008	0.119	(0.551)	0.889
27	2.25	5.00	1.200	0.119	(0.656)	1.081
28	2.33	3.50	0.840	0.119	(0.459)	0.721
29	2.42	6.80	1.632	0.119	(0.892)	1.513
30	2.50	7.30	1.752	0.119	(0.957)	1.633
31	2.58	8.20	1.968	0.119	(1.075)	1.849
32	2.67	5.90	1.416	0.119	(0.774)	1.297
33	2.75	2.00	0.480	0.119	(0.262)	0.361
34	2.83	1.80	0.432	0.119	(0.236)	0.313
35	2.92	1.80	0.432	0.119	(0.236)	0.313
36	3.00	0.60	0.144	(0.119)	0.079	0.065
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	19.7

Flood volume = Effective rainfall 1.65(In)
times area 14.2(Ac.)/[(In)/(Ft.)] = 1.9(Ac.Ft)

```
      Total soil loss =      0.35(In)
      Total soil loss =     0.418(Ac.Ft)
      Total rainfall =      2.00(In)
      Flood volume =       84650.1 Cubic Feet
      Total soil loss =       18217.8 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     25.366(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                       R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
  ---------------------------------------------------------------------------
    0+ 5       0.0125      1.82  V Q       |         |         |         |
    0+10       0.0315      2.75  V  Q      |         |         |         |
    0+15       0.0474      2.30  V  Q      |         |         |         |
    0+20       0.0678      2.97  |V Q      |         |         |         |
    0+25       0.0915      3.44  |V  Q     |         |         |         |
    0+30       0.1199      4.12  | V  Q    |         |         |         |
    0+35       0.1460      3.79  |  V Q    |         |         |         |
    0+40       0.1744      4.12  |  V Q    |         |         |         |
    0+45       0.2052      4.47  |   VQ    |         |         |         |
    0+50       0.2313      3.79  |   VQ    |         |         |         |
    0+55       0.2565      3.67  |   QV    |         |         |         |
    1+ 0       0.2857      4.24  |    Q    |         |         |         |
    1+ 5       0.3227      5.37  |     VQ  |         |         |         |
    1+10       0.3629      5.84  |      Q  |         |         |         |
    1+15       0.4032      5.84  |      QV |         |         |         |
    1+20       0.4403      5.39  |      Q V|         |         |         |
    1+25       0.4851      6.51  |       QV|         |         |         |
    1+30       0.5364      7.44  |        Q|V        |         |         |
    1+35       0.5837      6.88  |        Q| V       |         |         |
    1+40       0.6333      7.21  |        Q|  V      |         |         |
    1+45       0.6947      8.91  |         |Q  V     |         |         |
    1+50       0.7578      9.16  |         | Q  V    |         |         |
    1+55       0.8162      8.47  |         |Q    V   |         |         |
    2+ 0       0.8745      8.47  |         |Q      V |         |         |
    2+ 5       0.9352      8.81  |         |Q       V|         |         |
    2+10       1.0138     11.42  |         |    Q    V         |         |
    2+15       1.1137     14.51  |         |        Q| V       |         |
    2+20       1.1967     12.05  |         |     Q   |   V     |         |
    2+25       1.3191     17.77  |         |         |  Q   V  |         |
    2+30       1.4757     22.75  |         |         |        Q|         |
    2+35       1.6504     25.37  |         |         |         |  Q      |
    2+40       1.7965     21.21  |         |         |       Q |     V   |
    2+45       1.8633      9.70  |         | Q       |         |       V |
    2+50       1.8956      4.70  |     Q   |         |         |        V|
    2+55       1.9264      4.47  |    Q    |         |         |        V|
    3+ 0       1.9411      2.13  | Q       |         |         |        V|
    3+ 5       1.9433      0.32  Q         |         |         |         V
  ---------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRC1006100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	1.20	17.00

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	3.00	42.51

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 3.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
68.4	84.0	0.198	0.442	0.119	1.000	0.119
					Sum (F) =	0.119

Area averaged mean soil loss (F) (In/Hr) = 0.119
Minimum soil loss rate ((In/Hr)) = 0.060
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	414.178	66.038	9.431
2	0.167	828.355	33.962	4.850
			Sum = 100.000	Sum= 14.281

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.119)		0.098	0.082
2	0.17	0.60	0.216	(0.119)		0.118	0.098
3	0.25	0.60	0.216	(0.119)		0.118	0.098
4	0.33	0.60	0.216	(0.119)		0.118	0.098
5	0.42	0.60	0.216	(0.119)		0.118	0.098
6	0.50	0.70	0.252	0.119	(	0.138)	0.133
7	0.58	0.70	0.252	0.119	(	0.138)	0.133
8	0.67	0.70	0.252	0.119	(	0.138)	0.133
9	0.75	0.70	0.252	0.119	(	0.138)	0.133
10	0.83	0.70	0.252	0.119	(	0.138)	0.133
11	0.92	0.70	0.252	0.119	(	0.138)	0.133
12	1.00	0.80	0.288	0.119	(	0.157)	0.169
13	1.08	0.80	0.288	0.119	(	0.157)	0.169
14	1.17	0.80	0.288	0.119	(	0.157)	0.169
15	1.25	0.80	0.288	0.119	(	0.157)	0.169
16	1.33	0.80	0.288	0.119	(	0.157)	0.169
17	1.42	0.80	0.288	0.119	(	0.157)	0.169
18	1.50	0.80	0.288	0.119	(	0.157)	0.169
19	1.58	0.80	0.288	0.119	(	0.157)	0.169
20	1.67	0.80	0.288	0.119	(	0.157)	0.169
21	1.75	0.80	0.288	0.119	(	0.157)	0.169
22	1.83	0.80	0.288	0.119	(	0.157)	0.169
23	1.92	0.80	0.288	0.119	(	0.157)	0.169
24	2.00	0.90	0.324	0.119	(	0.177)	0.205
25	2.08	0.80	0.288	0.119	(	0.157)	0.169
26	2.17	0.90	0.324	0.119	(	0.177)	0.205
27	2.25	0.90	0.324	0.119	(	0.177)	0.205
28	2.33	0.90	0.324	0.119	(	0.177)	0.205
29	2.42	0.90	0.324	0.119	(	0.177)	0.205
30	2.50	0.90	0.324	0.119	(	0.177)	0.205
31	2.58	0.90	0.324	0.119	(	0.177)	0.205
32	2.67	0.90	0.324	0.119	(	0.177)	0.205
33	2.75	1.00	0.360	0.119	(	0.197)	0.241
34	2.83	1.00	0.360	0.119	(	0.197)	0.241
35	2.92	1.00	0.360	0.119	(	0.197)	0.241
36	3.00	1.00	0.360	0.119	(	0.197)	0.241
37	3.08	1.00	0.360	0.119	(	0.197)	0.241
38	3.17	1.10	0.396	0.119	(	0.216)	0.277
39	3.25	1.10	0.396	0.119	(	0.216)	0.277
40	3.33	1.10	0.396	0.119	(	0.216)	0.277

```
41   3.42     1.20      0.432          0.119    (  0.236)        0.313
42   3.50     1.30      0.468          0.119    (  0.256)        0.349
43   3.58     1.40      0.504          0.119    (  0.275)        0.385
44   3.67     1.40      0.504          0.119    (  0.275)        0.385
45   3.75     1.50      0.540          0.119    (  0.295)        0.421
46   3.83     1.50      0.540          0.119    (  0.295)        0.421
47   3.92     1.60      0.576          0.119    (  0.315)        0.457
48   4.00     1.60      0.576          0.119    (  0.315)        0.457
49   4.08     1.70      0.612          0.119    (  0.334)        0.493
50   4.17     1.80      0.648          0.119    (  0.354)        0.529
51   4.25     1.90      0.684          0.119    (  0.374)        0.565
52   4.33     2.00      0.720          0.119    (  0.393)        0.601
53   4.42     2.10      0.756          0.119    (  0.413)        0.637
54   4.50     2.10      0.756          0.119    (  0.413)        0.637
55   4.58     2.20      0.792          0.119    (  0.433)        0.673
56   4.67     2.30      0.828          0.119    (  0.452)        0.709
57   4.75     2.40      0.864          0.119    (  0.472)        0.745
58   4.83     2.40      0.864          0.119    (  0.472)        0.745
59   4.92     2.50      0.900          0.119    (  0.492)        0.781
60   5.00     2.60      0.936          0.119    (  0.511)        0.817
61   5.08     3.10      1.116          0.119    (  0.610)        0.997
62   5.17     3.60      1.296          0.119    (  0.708)        1.177
63   5.25     3.90      1.404          0.119    (  0.767)        1.285
64   5.33     4.20      1.512          0.119    (  0.826)        1.393
65   5.42     4.70      1.692          0.119    (  0.924)        1.573
66   5.50     5.60      2.016          0.119    (  1.101)        1.897
67   5.58     1.90      0.684          0.119    (  0.374)        0.565
68   5.67     0.90      0.324          0.119    (  0.177)        0.205
69   5.75     0.60      0.216       (  0.119)       0.118        0.098
70   5.83     0.50      0.180       (  0.119)       0.098        0.082
71   5.92     0.30      0.108       (  0.119)       0.059        0.049
72   6.00     0.20      0.072       (  0.119)       0.039        0.033
             (Loss Rate Not Used)
   Sum =     100.0                                   Sum =    27.6
      Flood volume = Effective rainfall      2.30(In)
       times area      14.2(Ac.)/[(In)/(Ft.)] =       2.7(Ac.Ft)
      Total soil loss =      0.70(In)
      Total soil loss =     0.826(Ac.Ft)
      Total rainfall =      3.00(In)
      Flood volume =      118325.3 Cubic Feet
      Total soil loss =       35978.5 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     25.528(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           6 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
-------------------------------------------------------------------------
  0+ 5       0.0053      0.77  VQ        |         |         |         |
  0+10       0.0144      1.32  VQ        |         |         |         |
  0+15       0.0240      1.40  VQ        |         |         |         |
  0+20       0.0337      1.40  VQ        |         |         |         |
  0+25       0.0433      1.40  VQ        |         |         |         |
  0+30       0.0552      1.73  V Q       |         |         |         |
  0+35       0.0683      1.90  |VQ       |         |         |         |
  0+40       0.0814      1.90  |VQ       |         |         |         |
  0+45       0.0944      1.90  |VQ       |         |         |         |
  0+50       0.1075      1.90  |VQ       |         |         |         |
  0+55       0.1206      1.90  |VQ       |         |         |         |
  1+ 0       0.1360      2.24  | Q       |         |         |         |
  1+ 5       0.1526      2.41  | VQ      |         |         |         |
  1+10       0.1692      2.41  | VQ      |         |         |         |
  1+15       0.1858      2.41  | VQ      |         |         |         |
  1+20       0.2024      2.41  | VQ      |         |         |         |
  1+25       0.2190      2.41  |  Q      |         |         |         |
  1+30       0.2356      2.41  |  Q      |         |         |         |
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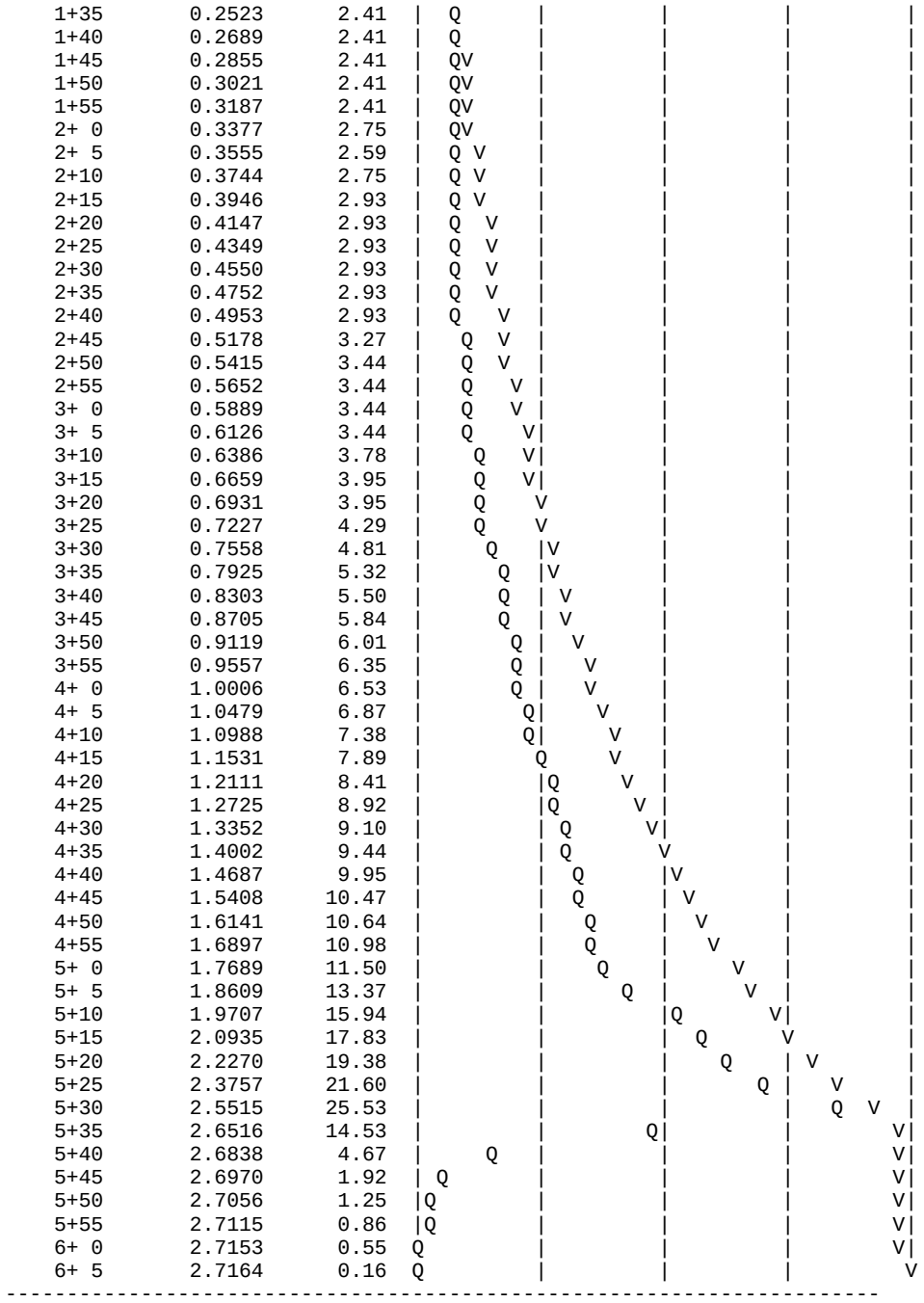

U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: PRC10024100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR HOUR STORM
HUNSAKER & ASSOCIATES, BRIAN LOWELL, PE

Drainage Area = 14.17(Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.17(Ac.) = 0.022 Sq. Mi.
Length along longest watercourse = 1178.00(Ft.)
Length along longest watercourse measured to centroid = 347.00(Ft.)
Length along longest watercourse = 0.223 Mi.
Length along longest watercourse measured to centroid = 0.066 Mi.
Difference in elevation = 187.90(Ft.)
Slope along watercourse = 842.2003 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.020 Hr.
Lag time = 1.21 Min.
25% of lag time = 0.30 Min.
40% of lag time = 0.48 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	2.00	28.34

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
14.17	5.00	70.85

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 5.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 5.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
14.170	68.40	0.442

Total Area Entered = 14.17(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
68.4	84.0	0.198	0.442	0.119	1.000	0.119
					Sum (F) =	0.119

Area averaged mean soil loss (F) (In/Hr) = 0.119
Minimum soil loss rate ((In/Hr)) = 0.060
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.546

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1 0.250	1242.533	100.000	14.281
		Sum = 100.000	Sum= 14.281

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.25	0.20	0.040	(0.210)		0.022	0.018
2	0.50	0.30	0.060	(0.208)		0.033	0.027
3	0.75	0.30	0.060	(0.206)		0.033	0.027
4	1.00	0.40	0.080	(0.203)		0.044	0.036
5	1.25	0.30	0.060	(0.201)		0.033	0.027
6	1.50	0.30	0.060	(0.198)		0.033	0.027
7	1.75	0.30	0.060	(0.196)		0.033	0.027
8	2.00	0.40	0.080	(0.194)		0.044	0.036
9	2.25	0.40	0.080	(0.191)		0.044	0.036
10	2.50	0.40	0.080	(0.189)		0.044	0.036
11	2.75	0.50	0.100	(0.187)		0.055	0.045
12	3.00	0.50	0.100	(0.184)		0.055	0.045
13	3.25	0.50	0.100	(0.182)		0.055	0.045
14	3.50	0.50	0.100	(0.180)		0.055	0.045
15	3.75	0.50	0.100	(0.178)		0.055	0.045
16	4.00	0.60	0.120	(0.175)		0.066	0.054
17	4.25	0.60	0.120	(0.173)		0.066	0.054
18	4.50	0.70	0.140	(0.171)		0.076	0.064
19	4.75	0.70	0.140	(0.169)		0.076	0.064
20	5.00	0.80	0.160	(0.167)		0.087	0.073
21	5.25	0.60	0.120	(0.164)		0.066	0.054
22	5.50	0.70	0.140	(0.162)		0.076	0.064
23	5.75	0.80	0.160	(0.160)		0.087	0.073
24	6.00	0.80	0.160	(0.158)		0.087	0.073
25	6.25	0.90	0.180	(0.156)		0.098	0.082
26	6.50	0.90	0.180	(0.154)		0.098	0.082
27	6.75	1.00	0.200	(0.152)		0.109	0.091
28	7.00	1.00	0.200	(0.150)		0.109	0.091
29	7.25	1.00	0.200	(0.148)		0.109	0.091
30	7.50	1.10	0.220	(0.146)		0.120	0.100
31	7.75	1.20	0.240	(0.144)		0.131	0.109
32	8.00	1.30	0.260	0.142	(	0.142)	0.118
33	8.25	1.50	0.300	0.140	(	0.164)	0.160
34	8.50	1.50	0.300	0.138	(	0.164)	0.162
35	8.75	1.60	0.320	0.136	(	0.175)	0.184
36	9.00	1.70	0.340	0.134	(	0.186)	0.206
37	9.25	1.90	0.380	0.132	(	0.208)	0.248
38	9.50	2.00	0.400	0.130	(	0.219)	0.270
39	9.75	2.10	0.420	0.128	(	0.229)	0.292
40	10.00	2.20	0.440	0.126	(	0.240)	0.314
41	10.25	1.50	0.300	0.125	(	0.164)	0.175

42	10.50	1.50	0.300	0.123	(0.164)	0.177	
43	10.75	2.00	0.400	0.121	(0.219)	0.279	
44	11.00	2.00	0.400	0.119	(0.219)	0.281	
45	11.25	1.90	0.380	0.118	(0.208)	0.262	
46	11.50	1.90	0.380	0.116	(0.208)	0.264	
47	11.75	1.70	0.340	0.114	(0.186)	0.226	
48	12.00	1.80	0.360	0.112	(0.197)	0.248	
49	12.25	2.50	0.500	0.111	(0.273)	0.389	
50	12.50	2.60	0.520	0.109	(0.284)	0.411	
51	12.75	2.80	0.560	0.107	(0.306)	0.453	
52	13.00	2.90	0.580	0.106	(0.317)	0.474	
53	13.25	3.40	0.680	0.104	(0.371)	0.576	
54	13.50	3.40	0.680	0.103	(0.371)	0.577	
55	13.75	2.30	0.460	0.101	(0.251)	0.359	
56	14.00	2.30	0.460	0.100	(0.251)	0.360	
57	14.25	2.70	0.540	0.098	(0.295)	0.442	
58	14.50	2.60	0.520	0.096	(0.284)	0.423	
59	14.75	2.60	0.520	0.095	(0.284)	0.425	
60	15.00	2.50	0.500	0.094	(0.273)	0.406	
61	15.25	2.40	0.480	0.092	(0.262)	0.388	
62	15.50	2.30	0.460	0.091	(0.251)	0.369	
63	15.75	1.90	0.380	0.089	(0.208)	0.291	
64	16.00	1.90	0.380	0.088	(0.208)	0.292	
65	16.25	0.40	0.080	(0.087)	0.044	0.036	
66	16.50	0.40	0.080	(0.085)	0.044	0.036	
67	16.75	0.30	0.060	(0.084)	0.033	0.027	
68	17.00	0.30	0.060	(0.083)	0.033	0.027	
69	17.25	0.50	0.100	(0.081)	0.055	0.045	
70	17.50	0.50	0.100	(0.080)	0.055	0.045	
71	17.75	0.50	0.100	(0.079)	0.055	0.045	
72	18.00	0.40	0.080	(0.078)	0.044	0.036	
73	18.25	0.40	0.080	(0.077)	0.044	0.036	
74	18.50	0.40	0.080	(0.076)	0.044	0.036	
75	18.75	0.30	0.060	(0.075)	0.033	0.027	
76	19.00	0.20	0.040	(0.073)	0.022	0.018	
77	19.25	0.30	0.060	(0.072)	0.033	0.027	
78	19.50	0.40	0.080	(0.071)	0.044	0.036	
79	19.75	0.30	0.060	(0.070)	0.033	0.027	
80	20.00	0.20	0.040	(0.070)	0.022	0.018	
81	20.25	0.30	0.060	(0.069)	0.033	0.027	
82	20.50	0.30	0.060	(0.068)	0.033	0.027	
83	20.75	0.30	0.060	(0.067)	0.033	0.027	
84	21.00	0.20	0.040	(0.066)	0.022	0.018	
85	21.25	0.30	0.060	(0.065)	0.033	0.027	
86	21.50	0.20	0.040	(0.065)	0.022	0.018	
87	21.75	0.30	0.060	(0.064)	0.033	0.027	
88	22.00	0.20	0.040	(0.063)	0.022	0.018	
89	22.25	0.30	0.060	(0.063)	0.033	0.027	
90	22.50	0.20	0.040	(0.062)	0.022	0.018	
91	22.75	0.20	0.040	(0.061)	0.022	0.018	
92	23.00	0.20	0.040	(0.061)	0.022	0.018	
93	23.25	0.20	0.040	(0.060)	0.022	0.018	
94	23.50	0.20	0.040	(0.060)	0.022	0.018	
95	23.75	0.20	0.040	(0.060)	0.022	0.018	
96	24.00	0.20	0.040	(0.060)	0.022	0.018	

(Loss Rate Not Used)

Sum = 100.0 Sum = 13.1

Flood volume = Effective rainfall 3.28(In)
times area 14.2(Ac.)/[(In)/(Ft.)] = 3.9(Ac.Ft)
Total soil loss = 1.72(In)
Total soil loss = 2.032(Ac.Ft)
Total rainfall = 5.00(In)
Flood volume = 168657.1 Cubic Feet
Total soil loss = 88521.3 Cubic Feet

Peak flow rate of this hydrograph = 8.250(CFS)

++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0054	0.26	VQ				
0+30	0.0134	0.39	VQ				
0+45	0.0214	0.39	VQ				
1+ 0	0.0321	0.52	V Q				
1+15	0.0402	0.39	VQ				
1+30	0.0482	0.39	VQ				
1+45	0.0562	0.39	VQ				
2+ 0	0.0670	0.52	V Q				
2+15	0.0777	0.52	V Q				
2+30	0.0884	0.52	V Q				
2+45	0.1018	0.65	VQ				
3+ 0	0.1152	0.65	VQ				
3+15	0.1286	0.65	VQ				
3+30	0.1420	0.65	VQ				
3+45	0.1554	0.65	VQ				
4+ 0	0.1714	0.78	V Q				
4+15	0.1875	0.78	V Q				
4+30	0.2062	0.91	VQ				
4+45	0.2250	0.91	VQ				
5+ 0	0.2464	1.04	V Q				
5+15	0.2625	0.78	VQ				
5+30	0.2812	0.91	VQ				
5+45	0.3027	1.04	VQ				
6+ 0	0.3241	1.04	VQ				
6+15	0.3482	1.17	VQ				
6+30	0.3723	1.17	VQ				
6+45	0.3991	1.30	VQ				
7+ 0	0.4259	1.30	VQ				
7+15	0.4527	1.30	VQ				
7+30	0.4821	1.43	VQ				
7+45	0.5143	1.56	VQ				
8+ 0	0.5492	1.69	VQ				
8+15	0.5965	2.29	V Q				
8+30	0.6444	2.32	V Q				
8+45	0.6987	2.63	V Q				
9+ 0	0.7596	2.94	V Q				
9+15	0.8328	3.54	V Q				
9+30	0.9124	3.86	V Q				
9+45	0.9985	4.17	V Q				
10+ 0	1.0911	4.48	V Q				
10+15	1.1428	2.51	QV				
10+30	1.1951	2.53	Q V				
10+45	1.2775	3.99	V Q				
11+ 0	1.3603	4.01	V Q				
11+15	1.4378	3.75	VQ				
11+30	1.5158	3.77	Q				
11+45	1.5825	3.23	Q V				
12+ 0	1.6556	3.54	Q V				
12+15	1.7705	5.56	V Q				
12+30	1.8919	5.87	V Q				
12+45	2.0255	6.47	V Q				
13+ 0	2.1654	6.78	V Q				
13+15	2.3354	8.23	V	Q			
13+30	2.5059	8.25	V	Q			
13+45	2.6118	5.13	Q V				
14+ 0	2.7183	5.15	Q V				
14+15	2.8487	6.32	Q V				
14+30	2.9737	6.05	Q V				
14+45	3.0992	6.07	Q	V			
15+ 0	3.2192	5.81	Q	V			
15+15	3.3337	5.54	Q	V			
15+30	3.4427	5.28	Q	V			
15+45	3.5285	4.15	Q	V			
16+ 0	3.6147	4.17	Q	V			
16+15	3.6254	0.52	Q	V			
16+30	3.6361	0.52	Q	V			

16+45	3.6442	0.39	Q				V
17+ 0	3.6522	0.39	Q				V
17+15	3.6656	0.65	Q				V
17+30	3.6790	0.65	Q				V
17+45	3.6924	0.65	Q				V
18+ 0	3.7031	0.52	Q				V
18+15	3.7138	0.52	Q				V
18+30	3.7245	0.52	Q				V
18+45	3.7326	0.39	Q				V
19+ 0	3.7379	0.26	Q				V
19+15	3.7459	0.39	Q				V
19+30	3.7567	0.52	Q				V
19+45	3.7647	0.39	Q				V
20+ 0	3.7700	0.26	Q				V
20+15	3.7781	0.39	Q				V
20+30	3.7861	0.39	Q				V
20+45	3.7942	0.39	Q				V
21+ 0	3.7995	0.26	Q				V
21+15	3.8075	0.39	Q				V
21+30	3.8129	0.26	Q				V
21+45	3.8209	0.39	Q				V
22+ 0	3.8263	0.26	Q				V
22+15	3.8343	0.39	Q				V
22+30	3.8397	0.26	Q				V
22+45	3.8450	0.26	Q				V
23+ 0	3.8504	0.26	Q				V
23+15	3.8558	0.26	Q				V
23+30	3.8611	0.26	Q				V
23+45	3.8665	0.26	Q				V
24+ 0	3.8718	0.26	Q				V

Area D

- Area 'D' – 2 Year Pre-Development Condition – Rational Method

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 04/30/21 File:EXD002.out

TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'D'
EXISTING CONDITION - RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation = 0.550(In.)
100 year, 1 hour precipitation = 1.300(In.)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.550(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 401.000 to Point/Station 402.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 1778.000(Ft.)
Bottom (of initial area) elevation = 1553.000(Ft.)
Difference in elevation = 225.000(Ft.)
Slope = 0.22500 s(percent)= 22.50
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.320 min.
Rainfall intensity = 1.331(In/Hr) for a 2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.592
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 65.80
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 7.879(CFS)

```
Total initial stream area =       10.000(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      403.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1553.000(Ft.)
End of natural channel elevation =   1527.000(Ft.)
Length of natural channel  =   987.000(Ft.)
Estimated mean flow rate at midpoint of channel =     24.347(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   5.13(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0263
Corrected/adjusted channel slope =  0.0263
Travel time =    3.21 min.     TC =   14.53  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.565
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  65.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.166(In/Hr) for a     2.0 year storm
Subarea runoff =     27.525(CFS) for     41.800(Ac.)
Total runoff =     35.404(CFS)  Total area =      51.800(Ac.)
End of computations, total study area =           51.80 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  82.0
```

- Area 'D' – 10 Year Pre-Development Condition – Rational Method

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 04/30/21 File:EXD010.out

TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'D'
EXISTING CONDITION - RATIONAL METHOD - 10 YEAR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.550(In.)
100 year, 1 hour precipitation = 1.300(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.859(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 401.000 to Point/Station 402.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 1778.000(Ft.)
Bottom (of initial area) elevation = 1553.000(Ft.)
Difference in elevation = 225.000(Ft.)
Slope = 0.22500 s(percent)= 22.50
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.320 min.
Rainfall intensity = 2.078(In/Hr) for a 10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.789
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 82.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 16.393(CFS)

```
Total initial stream area =       10.000(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      402.000 to Point/Station      403.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1553.000(Ft.)
End of natural channel elevation =   1527.000(Ft.)
Length of natural channel  =   987.000(Ft.)
Estimated mean flow rate at midpoint of channel =     50.656(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   6.31(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0263
Corrected/adjusted channel slope =  0.0263
Travel time =    2.61 min.     TC =   13.93  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.778
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  82.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.862(In/Hr) for a    10.0 year storm
Subarea runoff =     60.524(CFS) for     41.800(Ac.)
Total runoff =     76.917(CFS)  Total area =      51.800(Ac.)
End of computations, total study area =           51.80 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  82.0
```

- Area 'D' – 100 Year Pre-Development Condition – Rational Method

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 04/30/21 File:EXD100.out

TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'D'
EXISTING CONDITION - RATIONAL METHOD - 100 YEAR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6406

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

2 year, 1 hour precipitation = 0.550(In.)
100 year, 1 hour precipitation = 1.300(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.300(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 401.000 to Point/Station 402.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 1778.000(Ft.)
Bottom (of initial area) elevation = 1553.000(Ft.)
Difference in elevation = 225.000(Ft.)
Slope = 0.22500 s(percent)= 22.50
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.320 min.
Rainfall intensity = 3.147(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.869
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 92.20
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 27.339(CFS)

```
Total initial stream area =       10.000(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      402.000 to Point/Station      403.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1553.000(Ft.)
End of natural channel elevation =   1527.000(Ft.)
Length of natural channel  =   987.000(Ft.)
Estimated mean flow rate at midpoint of channel =     84.476(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   7.33(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0263
Corrected/adjusted channel slope =  0.0263
Travel time =    2.25 min.     TC =   13.57  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.866
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  92.20
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.859(In/Hr) for a   100.0 year storm
Subarea runoff =    103.463(CFS) for     41.800(Ac.)
Total runoff =    130.801(CFS)  Total area =      51.800(Ac.)
End of computations, total study area =           51.80 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  82.0
```

- Area 'D' – 2 Year Post-Development Condition – Rational Method

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 05/18/21 File:PRD002.out

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
DEVELOPED CONDITION RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6407

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation = 0.550(In.)
100 year, 1 hour precipitation = 1.300(In.)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.550(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 470.000 to Point/Station 471.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 1566.100(Ft.)
Bottom (of initial area) elevation = 1546.000(Ft.)
Difference in elevation = 20.100(Ft.)
Slope = 0.02010 s(percent)= 2.01
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.503 min.
Rainfall intensity = 1.212(In/Hr) for a 2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.602
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 36.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 3.826(CFS)
Total initial stream area = 5.240(Ac.)
Pervious area fraction = 0.500

++

Process from Point/Station 471.000 to Point/Station 439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1538.000(Ft.)
Downstream point/station elevation = 1533.400(Ft.)
Pipe length = 353.00(Ft.) Manning's N = 0.013

```
No. of pipes = 1  Required pipe flow  =     3.826(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.826(CFS)
Normal flow depth in pipe =    9.26(In.)
Flow top width inside pipe =   10.08(In.)
Critical Depth =    9.98(In.)
Pipe flow velocity =      5.89(Ft/s)
Travel time through pipe =    1.00 min.
Time of concentration (TC) =    14.50 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      471.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      5.240(Ac.)
Runoff from this stream =      3.826(CFS)
Time of concentration =   14.50 min.
Rainfall intensity =     1.167(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      473.000 to Point/Station      443.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   759.000(Ft.)
Top (of initial area) elevation =  1552.000(Ft.)
Bottom (of initial area) elevation =  1539.800(Ft.)
Difference in elevation =    12.200(Ft.)
Slope =    0.01607  s(percent)=       1.61
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.646 min.
Rainfall intensity =      1.255(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.606
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.141(CFS)
Total initial stream area =        4.130(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      443.000 to Point/Station      439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    28.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.141(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.141(CFS)
Normal flow depth in pipe =    7.66(In.)
Flow top width inside pipe =   11.53(In.)
Critical Depth =    9.11(In.)
Pipe flow velocity =      5.93(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    12.72 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      443.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.130(Ac.)
```

```
Runoff from this stream =      3.141(CFS)
Time of concentration =   12.72 min.
Rainfall intensity =     1.251(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      474.000 to Point/Station      441.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =    96.000(Ft.)
Top (of initial area) elevation =  1543.200(Ft.)
Bottom (of initial area) elevation =  1539.800(Ft.)
Difference in elevation =     3.400(Ft.)
Slope =    0.03542  s(percent)=       3.54
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.053(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.752
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.154(CFS)
Total initial stream area =        0.100(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      441.000 to Point/Station      439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    31.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.154(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.154(CFS)
Normal flow depth in pipe =    2.01(In.)
Flow top width inside pipe =    5.66(In.)
Critical Depth =    2.35(In.)
Pipe flow velocity =      2.67(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =     5.19 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      441.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      0.100(Ac.)
Runoff from this stream =      0.154(CFS)
Time of concentration =    5.19 min.
Rainfall intensity =     2.012(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        3.826     14.50                1.167
2        3.141     12.72                1.251
3        0.154      5.19                2.012
Largest stream flow has longer time of concentration
Qp =      3.826 + sum of
          Qb         Ia/Ib
```

```
          3.141 *    0.933 =      2.930
         Qb         Ia/Ib
          0.154 *    0.580 =      0.090
Qp =      6.846

Total of 3 streams to confluence:
Flow rates before confluence point:
       3.826       3.141       0.154
Area of streams before confluence:
        5.240       4.130       0.100
Results of confluence:
Total flow rate =      6.846(CFS)
Time of concentration =    14.502 min.
Effective stream area after confluence =      9.470(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      439.000 to Point/Station      444.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.400(Ft.)
Downstream point/station elevation =  1532.500(Ft.)
Pipe length  =    72.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.846(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.846(CFS)
Normal flow depth in pipe =   11.65(In.)
Flow top width inside pipe =   12.50(In.)
Critical Depth =   12.60(In.)
Pipe flow velocity =      6.70(Ft/s)
Travel time through pipe =    0.18 min.
Time of concentration (TC) =    14.68 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      439.000 to Point/Station      444.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      9.470(Ac.)
Runoff from this stream =      6.846(CFS)
Time of concentration =   14.68 min.
Rainfall intensity =     1.160(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      445.000 to Point/Station      446.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =    42.000(Ft.)
Top (of initial area) elevation =  1540.500(Ft.)
Bottom (of initial area) elevation =  1539.400(Ft.)
Difference in elevation =     1.100(Ft.)
Slope =    0.02619  s(percent)=       2.62
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.053(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.659
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.081(CFS)
Total initial stream area =        0.060(Ac.)
```

```
Pervious area fraction = 0.500


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Process from Point/Station      446.000 to Point/Station      447.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.081(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.081(CFS)
Normal flow depth in pipe =    1.13(In.)
Flow top width inside pipe =    8.73(In.)
Critical Depth =    1.25(In.)
Pipe flow velocity =      1.77(Ft/s)
Travel time through pipe =    0.38 min.
Time of concentration (TC) =     5.38 min.


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Process from Point/Station      446.000 to Point/Station      447.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.060(Ac.)
Runoff from this stream =      0.081(CFS)
Time of concentration =    5.38 min.
Rainfall intensity =     1.975(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      448.000 to Point/Station      449.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   640.000(Ft.)
Top (of initial area) elevation =  1587.200(Ft.)
Bottom (of initial area) elevation =  1540.300(Ft.)
Difference in elevation =    46.900(Ft.)
Slope =    0.07328  s(percent)=       7.33
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.876 min.
Rainfall intensity =      1.113(In/Hr) for a     2.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.462
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  55.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.313(CFS)
Total initial stream area =        0.610(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      449.000 to Point/Station      447.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    35.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.313(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.313(CFS)
Normal flow depth in pipe =    2.07(In.)
Flow top width inside pipe =   11.48(In.)
Critical depth could not be calculated.
Pipe flow velocity =      2.78(Ft/s)
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Travel time through pipe =    0.21 min.
Time of concentration (TC) =    16.09 min.


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Process from Point/Station      449.000 to Point/Station      447.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      0.610(Ac.)
Runoff from this stream =      0.313(CFS)
Time of concentration =   16.09 min.
Rainfall intensity =     1.105(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        0.081      5.38                1.975
2        0.313     16.09                1.105
Largest stream flow has longer time of concentration
Qp =      0.313 + sum of
          Qb         Ia/Ib
           0.081 *    0.559 =      0.045
Qp =      0.359

Total of 2 streams to confluence:
Flow rates before confluence point:
       0.081       0.313
Area of streams before confluence:
        0.060        0.610
Results of confluence:
Total flow rate =      0.359(CFS)
Time of concentration =    16.085 min.
Effective stream area after confluence =      0.670(Ac.)


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Process from Point/Station      447.000 to Point/Station      444.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.400(Ft.)
Downstream point/station elevation =  1532.500(Ft.)
Pipe length  =    89.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.359(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =     0.359(CFS)
Normal flow depth in pipe =    2.10(In.)
Flow top width inside pipe =   13.57(In.)
Critical depth could not be calculated.
Pipe flow velocity =      2.67(Ft/s)
Travel time through pipe =    0.56 min.
Time of concentration (TC) =    16.64 min.


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Process from Point/Station      447.000 to Point/Station      444.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.670(Ac.)
Runoff from this stream =      0.359(CFS)
Time of concentration =   16.64 min.
Rainfall intensity =     1.085(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1        6.846     14.68               1.160
2        0.359     16.64               1.085
Largest stream flow has longer or shorter time of concentration
Qp =      6.846 + sum of
          Qa          Tb/Ta
           0.359 *    0.882 =      0.317
Qp =      7.163

Total of 2 main streams to confluence:
Flow rates before confluence point:
       6.846       0.359
Area of streams before confluence:
        9.470        0.670


Results of confluence:
Total flow rate =      7.163(CFS)
Time of concentration =    14.681 min.
Effective stream area after confluence  =     10.140(Ac.)


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Process from Point/Station      444.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1532.500(Ft.)
Downstream point/station elevation =  1532.000(Ft.)
Pipe length  =    46.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.163(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =     7.163(CFS)
Normal flow depth in pipe =    9.07(In.)
Flow top width inside pipe =   23.27(In.)
Critical Depth =   11.40(In.)
Pipe flow velocity =      6.58(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    14.80 min.


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Process from Point/Station      444.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     10.140(Ac.)
Runoff from this stream =      7.163(CFS)
Time of concentration =   14.80 min.
Rainfall intensity =     1.155(In/Hr)


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Process from Point/Station      451.000 to Point/Station      452.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   388.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1540.100(Ft.)
Difference in elevation =     3.700(Ft.)
Slope =    0.00954  s(percent)=       0.95
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.733 min.
Rainfall intensity =      1.369(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.615
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
```

```
Initial subarea runoff =      0.219(CFS)
Total initial stream area =        0.260(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      452.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1532.700(Ft.)
Downstream point/station elevation =  1532.000(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.219(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.219(CFS)
Normal flow depth in pipe =    1.56(In.)
Flow top width inside pipe =   10.12(In.)
Critical Depth =    2.05(In.)
Pipe flow velocity =      2.95(Ft/s)
Travel time through pipe =    0.21 min.
Time of concentration (TC) =    10.95 min.


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Process from Point/Station      452.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.260(Ac.)
Runoff from this stream =      0.219(CFS)
Time of concentration =   10.95 min.
Rainfall intensity =     1.355(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        7.163     14.80                1.155
2        0.219     10.95                1.355
Largest stream flow has longer time of concentration
Qp =      7.163 + sum of
          Qb         Ia/Ib
           0.219 *    0.852 =      0.187
Qp =      7.350

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.163       0.219
Area of streams before confluence:
       10.140        0.260
Results of confluence:
Total flow rate =      7.350(CFS)
Time of concentration =    14.798 min.
Effective stream area after confluence =     10.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      450.000 to Point/Station      459.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1526.000(Ft.)
Pipe length  =   418.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.350(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =     7.350(CFS)
Normal flow depth in pipe =    7.38(In.)
Flow top width inside pipe =   29.06(In.)
Critical Depth =   10.24(In.)
Pipe flow velocity =      7.05(Ft/s)
```

```
Travel time through pipe =    0.99 min.
Time of concentration (TC) =    15.79 min.


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Process from Point/Station      450.000 to Point/Station      459.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     10.400(Ac.)
Runoff from this stream =      7.350(CFS)
Time of concentration =   15.79 min.
Rainfall intensity =     1.116(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      418.000 to Point/Station      419.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------------
Initial area flow distance =   332.000(Ft.)
Top (of initial area) elevation =  1544.200(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01566  s(percent)=       1.57
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.132 min.
Rainfall intensity =      1.492(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.719
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.469(CFS)
Total initial stream area =        1.370(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      419.000 to Point/Station      459.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1531.000(Ft.)
Downstream point/station elevation =  1526.000(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.469(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.469(CFS)
Normal flow depth in pipe =    2.63(In.)
Flow top width inside pipe =   12.71(In.)
Critical Depth =    5.44(In.)
Pipe flow velocity =      9.19(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =     9.23 min.


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Process from Point/Station      419.000 to Point/Station      459.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.370(Ac.)
Runoff from this stream =      1.469(CFS)
Time of concentration =    9.23 min.
Rainfall intensity =     1.483(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1        7.350     15.79                 1.116
2        1.469      9.23                 1.483
Largest stream flow has longer time of concentration
Qp =      7.350 + sum of
          Qb         Ia/Ib
           1.469 *    0.752 =      1.105
Qp =      8.455

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.350       1.469
Area of streams before confluence:
       10.400        1.370
Results of confluence:
Total flow rate =      8.455(CFS)
Time of concentration =    15.785 min.
Effective stream area after confluence =     11.770(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      459.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1526.000(Ft.)
Downstream point/station elevation =  1523.700(Ft.)
Pipe length  =   316.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.455(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =     8.455(CFS)
Normal flow depth in pipe =    9.38(In.)
Flow top width inside pipe =   31.60(In.)
Critical Depth =   11.00(In.)
Pipe flow velocity =      5.77(Ft/s)
Travel time through pipe =    0.91 min.
Time of concentration (TC) =    16.70 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      459.000 to Point/Station      420.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     11.770(Ac.)
Runoff from this stream =      8.455(CFS)
Time of concentration =   16.70 min.
Rainfall intensity =     1.083(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      421.000 to Point/Station      422.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   508.000(Ft.)
Top (of initial area) elevation =  1541.200(Ft.)
Bottom (of initial area) elevation =  1535.400(Ft.)
Difference in elevation =     5.800(Ft.)
Slope =    0.01142  s(percent)=       1.14
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.532 min.
Rainfall intensity =      1.318(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.664
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.600
RI index for soil(AMC 1)  =  47.88
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.451(CFS)
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Total initial stream area =        2.800(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      422.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1528.300(Ft.)
Downstream point/station elevation =  1523.700(Ft.)
Pipe length  =    52.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.451(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     2.451(CFS)
Normal flow depth in pipe =    3.41(In.)
Flow top width inside pipe =   14.11(In.)
Critical Depth =    7.10(In.)
Pipe flow velocity =     10.53(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    11.61 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      422.000 to Point/Station      420.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.800(Ac.)
Runoff from this stream =      2.451(CFS)
Time of concentration =   11.61 min.
Rainfall intensity =     1.313(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        8.455     16.70                1.083
2        2.451     11.61                1.313
Largest stream flow has longer time of concentration
Qp =      8.455 + sum of
          Qb         Ia/Ib
           2.451 *    0.825 =      2.022
Qp =     10.477

Total of 2 streams to confluence:
Flow rates before confluence point:
       8.455       2.451
Area of streams before confluence:
       11.770        2.800
Results of confluence:
Total flow rate =     10.477(CFS)
Time of concentration =    16.697 min.
Effective stream area after confluence =     14.570(Ac.)


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Process from Point/Station      420.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1523.700(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =   350.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.477(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    10.477(CFS)
Normal flow depth in pipe =   10.31(In.)
Flow top width inside pipe =   32.55(In.)
Critical Depth =   12.29(In.)
Pipe flow velocity =      6.27(Ft/s)
Travel time through pipe =    0.93 min.
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Time of concentration (TC) =    17.63 min.


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Process from Point/Station      420.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     14.570(Ac.)
Runoff from this stream =     10.477(CFS)
Time of concentration =   17.63 min.
Rainfall intensity =     1.053(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      415.000 to Point/Station      416.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1545.700(Ft.)
Bottom (of initial area) elevation =  1530.400(Ft.)
Difference in elevation =    15.300(Ft.)
Slope =    0.01530  s(percent)=       1.53
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.260 min.
Rainfall intensity =      1.178(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.672
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.200
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.800
RI index for soil(AMC 1)  =  52.44
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.842(CFS)
Total initial stream area =        3.590(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      416.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1523.300(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =    26.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.842(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     2.842(CFS)
Normal flow depth in pipe =    3.67(In.)
Flow top width inside pipe =   14.50(In.)
Critical Depth =    7.68(In.)
Pipe flow velocity =     11.00(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    14.30 min.


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Process from Point/Station      416.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.590(Ac.)
Runoff from this stream =      2.842(CFS)
Time of concentration =   14.30 min.
Rainfall intensity =     1.176(In/Hr)


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Process from Point/Station      421.000 to Point/Station      423.000
**** INITIAL AREA EVALUATION ****
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Initial area flow distance =   790.000(Ft.)
Top (of initial area) elevation =  1541.200(Ft.)
Bottom (of initial area) elevation =  1530.400(Ft.)
Difference in elevation =    10.800(Ft.)
Slope =    0.01367  s(percent)=       1.37
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.273 min.
Rainfall intensity =      1.224(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.612
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.900
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.100
RI index for soil(AMC 1)  =  37.90
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.422(CFS)
Total initial stream area =        1.900(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      423.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1523.300(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =    24.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.422(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.422(CFS)
Normal flow depth in pipe =    2.57(In.)
Flow top width inside pipe =   12.58(In.)
Critical Depth =    5.36(In.)
Pipe flow velocity =      9.21(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    13.32 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      423.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      1.900(Ac.)
Runoff from this stream =      1.422(CFS)
Time of concentration =   13.32 min.
Rainfall intensity =     1.221(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       10.477     17.63                1.053
2        2.842     14.30                1.176
3        1.422     13.32                1.221
Largest stream flow has longer time of concentration
Qp =     10.477 + sum of
          Qb         Ia/Ib
           2.842 *    0.895 =      2.543
          Qb         Ia/Ib
           1.422 *    0.862 =      1.225
Qp =     14.246

Total of 3 streams to confluence:
Flow rates before confluence point:
      10.477       2.842       1.422
Area of streams before confluence:
       14.570        3.590        1.900
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Results of confluence:
Total flow rate =     14.246(CFS)
Time of concentration =    17.628 min.
Effective stream area after confluence =     20.060(Ac.)


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Process from Point/Station      417.000 to Point/Station      414.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1521.000(Ft.)
Downstream point/station elevation =  1518.500(Ft.)
Pipe length  =   388.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.246(CFS)
Given pipe size =     48.00(In.)
Calculated individual pipe flow  =    14.246(CFS)
Normal flow depth in pipe =   11.39(In.)
Flow top width inside pipe =   40.84(In.)
Critical Depth =   13.24(In.)
Pipe flow velocity =      6.24(Ft/s)
Travel time through pipe =    1.04 min.
Time of concentration (TC) =    18.66 min.


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Process from Point/Station      417.000 to Point/Station      414.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     20.060(Ac.)
Runoff from this stream =     14.246(CFS)
Time of concentration =   18.66 min.
Rainfall intensity =     1.021(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   490.000(Ft.)
Top (of initial area) elevation =  1545.600(Ft.)
Bottom (of initial area) elevation =  1540.400(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01061  s(percent)=       1.06
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.534 min.
Rainfall intensity =      1.318(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.640
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  42.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.527(CFS)
Total initial stream area =        1.810(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      401.000 to Point/Station      402.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =  1540.400(Ft.)
End of street segment elevation =  1532.700(Ft.)
Length of street segment  =   763.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
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Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      3.277(CFS)
Depth of flow =   0.299(Ft.), Average velocity =   2.664(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  10.700(Ft.)
Flow velocity =   2.66(Ft/s)
Travel time =    4.77 min.     TC =   16.31  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.641
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  47.28
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.097(In/Hr) for a     2.0 year storm
Subarea runoff =      3.411(CFS) for      4.850(Ac.)
Total runoff =      4.938(CFS)       Total area =       6.660(Ac.)
Street flow at end of street =      4.938(CFS)
Half street flow at end of street =      4.938(CFS)
Depth of flow =   0.338(Ft.), Average velocity =   2.939(Ft/s)
Flow width (from curb towards crown)=  12.629(Ft.)


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Process from Point/Station      402.000 to Point/Station      403.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =  1532.700(Ft.)
End of street segment elevation =  1529.300(Ft.)
Length of street segment  =   380.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      5.471(CFS)
Depth of flow =   0.354(Ft.), Average velocity =   2.879(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.474(Ft.)
Flow velocity =   2.88(Ft/s)
Travel time =    2.20 min.     TC =   18.51  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.599
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.100
RI index for soil(AMC 1)  =  39.20
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.026(In/Hr) for a     2.0 year storm
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Subarea runoff =      1.014(CFS) for      1.650(Ac.)
Total runoff =      5.952(CFS)        Total area =       8.310(Ac.)
Street flow at end of street =      5.952(CFS)
Half street flow at end of street =      5.952(CFS)
Depth of flow =   0.364(Ft.), Average velocity =   2.938(Ft/s)
Flow width (from curb towards crown)=  13.931(Ft.)


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Process from Point/Station      403.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    35.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.952(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     5.952(CFS)
Normal flow depth in pipe =    7.92(In.)
Flow top width inside pipe =   17.87(In.)
Critical Depth =   11.31(In.)
Pipe flow velocity =      7.94(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    18.58 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      403.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      8.310(Ac.)
Runoff from this stream =      5.952(CFS)
Time of concentration =   18.58 min.
Rainfall intensity =     1.024(In/Hr)


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Process from Point/Station      400.000 to Point/Station      405.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   530.000(Ft.)
Top (of initial area) elevation =  1545.600(Ft.)
Bottom (of initial area) elevation =  1540.600(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.00943  s(percent)=       0.94
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.185 min.
Rainfall intensity =      1.280(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.619
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.200
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  38.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.006(CFS)
Total initial stream area =        2.530(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      405.000 to Point/Station      406.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =  1540.600(Ft.)
End of street segment elevation =  1532.700(Ft.)
Length of street segment  =   777.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
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Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.843(CFS)
Depth of flow =   0.287(Ft.), Average velocity =   2.584(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  10.077(Ft.)
Flow velocity =   2.58(Ft/s)
Travel time =    5.01 min.     TC =   17.20  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.662
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.600
Decimal fraction soil group D = 0.400
RI index for soil(AMC 1)  =  52.68
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.067(In/Hr) for a     2.0 year storm
Subarea runoff =      1.624(CFS) for      2.300(Ac.)
Total runoff =      3.630(CFS)       Total area =       4.830(Ac.)
Street flow at end of street =      3.630(CFS)
Half street flow at end of street =      3.630(CFS)
Depth of flow =   0.308(Ft.), Average velocity =   2.738(Ft/s)
Flow width (from curb towards crown)=  11.140(Ft.)


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Process from Point/Station      406.000 to Point/Station      407.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =  1532.700(Ft.)
End of street segment elevation =  1529.300(Ft.)
Length of street segment  =   343.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      4.775(CFS)
Depth of flow =   0.335(Ft.), Average velocity =   2.896(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  12.506(Ft.)
Flow velocity =   2.90(Ft/s)
Travel time =    1.97 min.     TC =   19.17  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.621
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.400
RI index for soil(AMC 1)  =  44.90
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.007(In/Hr) for a     2.0 year storm
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Subarea runoff =      2.234(CFS) for      3.570(Ac.)
Total runoff =      5.864(CFS)        Total area =       8.400(Ac.)
Street flow at end of street =      5.864(CFS)
Half street flow at end of street =      5.864(CFS)
Depth of flow =   0.356(Ft.), Average velocity =   3.043(Ft/s)
Flow width (from curb towards crown)=  13.571(Ft.)


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Process from Point/Station      407.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    36.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.864(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =     5.864(CFS)
Normal flow depth in pipe =    7.01(In.)
Flow top width inside pipe =   21.82(In.)
Critical Depth =   10.26(In.)
Pipe flow velocity =      7.68(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    19.25 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      407.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      8.400(Ac.)
Runoff from this stream =      5.864(CFS)
Time of concentration =   19.25 min.
Rainfall intensity =     1.005(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      408.000 to Point/Station      409.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   395.000(Ft.)
Top (of initial area) elevation =  1533.500(Ft.)
Bottom (of initial area) elevation =  1529.200(Ft.)
Difference in elevation =     4.300(Ft.)
Slope =    0.01089  s(percent)=       1.09
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.528 min.
Rainfall intensity =      1.383(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.659
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.985(CFS)
Total initial stream area =        1.080(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      409.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    45.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.985(CFS)
Given pipe size =     18.00(In.)
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Calculated individual pipe flow  =     0.985(CFS)
Normal flow depth in pipe =    3.34(In.)
Flow top width inside pipe =   13.99(In.)
Critical Depth =    4.43(In.)
Pipe flow velocity =      4.36(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =    10.70 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      409.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      1.080(Ac.)
Runoff from this stream =      0.985(CFS)
Time of concentration =   10.70 min.
Rainfall intensity =     1.372(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        5.952     18.58                1.024
2        5.864     19.25                1.005
3        0.985     10.70                1.372
Largest stream flow has longer or shorter time of concentration
Qp =      5.952 + sum of
          Qa          Tb/Ta
           5.864 *    0.965 =      5.660
          Qb         Ia/Ib
           0.985 *    0.746 =      0.735
Qp =     12.347

Total of 3 streams to confluence:
Flow rates before confluence point:
       5.952       5.864       0.985
Area of streams before confluence:
        8.310        8.400        1.080
Results of confluence:
Total flow rate =     12.347(CFS)
Time of concentration =    18.581 min.
Effective stream area after confluence =     17.790(Ac.)


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Process from Point/Station      404.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1522.100(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =   322.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.347(CFS)
Given pipe size =     30.00(In.)
Calculated individual pipe flow  =    12.347(CFS)
Normal flow depth in pipe =   11.12(In.)
Flow top width inside pipe =   28.98(In.)
Critical Depth =   14.13(In.)
Pipe flow velocity =      7.46(Ft/s)
Travel time through pipe =    0.72 min.
Time of concentration (TC) =    19.30 min.


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Process from Point/Station      404.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =     17.790(Ac.)
Runoff from this stream =     12.347(CFS)
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Time of concentration =   19.30 min.
Rainfall intensity =     1.003(In/Hr)


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Process from Point/Station      411.000 to Point/Station      412.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   515.000(Ft.)
Top (of initial area) elevation =  1531.500(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     5.800(Ft.)
Slope =    0.01126  s(percent)=       1.13
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.627 min.
Rainfall intensity =      1.312(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.689
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  53.40
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.039(CFS)
Total initial stream area =        1.150(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      412.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1518.900(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.039(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.039(CFS)
Normal flow depth in pipe =    3.82(In.)
Flow top width inside pipe =   14.72(In.)
Critical Depth =    4.56(In.)
Pipe flow velocity =      3.79(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    11.71 min.


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Process from Point/Station      412.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      1.150(Ac.)
Runoff from this stream =      1.039(CFS)
Time of concentration =   11.71 min.
Rainfall intensity =     1.307(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      407.000 to Point/Station      413.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   311.000(Ft.)
Top (of initial area) elevation =  1528.400(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     2.700(Ft.)
Slope =    0.00868  s(percent)=       0.87
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.010 min.
Rainfall intensity =      1.421(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
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Runoff Coefficient = 0.636
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.200
RI index for soil(AMC 1)  =  39.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.003(CFS)
Total initial stream area =        1.110(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      413.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1518.900(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.003(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.003(CFS)
Normal flow depth in pipe =    3.97(In.)
Flow top width inside pipe =   14.93(In.)
Critical Depth =    4.47(In.)
Pipe flow velocity =      3.47(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    10.13 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      413.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      1.110(Ac.)
Runoff from this stream =      1.003(CFS)
Time of concentration =   10.13 min.
Rainfall intensity =     1.412(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       12.347     19.30                1.003
2        1.039     11.71                1.307
3        1.003     10.13                1.412
Largest stream flow has longer time of concentration
Qp =     12.347 + sum of
          Qb         Ia/Ib
           1.039 *    0.768 =      0.798
          Qb         Ia/Ib
           1.003 *    0.711 =      0.713
Qp =     13.858

Total of 3 streams to confluence:
Flow rates before confluence point:
      12.347       1.039       1.003
Area of streams before confluence:
       17.790        1.150        1.110
Results of confluence:
Total flow rate =     13.858(CFS)
Time of concentration =    19.300 min.
Effective stream area after confluence =     20.050(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      410.000 to Point/Station      414.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
```

```
Upstream point/station elevation =  1518.700(Ft.)
Downstream point/station elevation =  1518.500(Ft.)
Pipe length  =    55.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.858(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    13.858(CFS)
Normal flow depth in pipe =   20.02(In.)
Flow top width inside pipe =   17.86(In.)
Critical Depth =   16.09(In.)
Pipe flow velocity =      4.95(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    19.49 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      410.000 to Point/Station      414.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     20.050(Ac.)
Runoff from this stream =     13.858(CFS)
Time of concentration =   19.49 min.
Rainfall intensity =     0.998(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       14.246     18.66               1.021
2       13.858     19.49               0.998
Largest stream flow has longer or shorter time of concentration
Qp =     14.246 + sum of
          Qa          Tb/Ta
          13.858 *    0.958 =     13.273
Qp =     27.519

Total of 2 main streams to confluence:
Flow rates before confluence point:
      14.246      13.858
Area of streams before confluence:
       20.060       20.050


Results of confluence:
Total flow rate =     27.519(CFS)
Time of concentration =    18.664 min.
Effective stream area after confluence  =     40.110(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      414.000 to Point/Station      424.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1518.500(Ft.)
Downstream point/station elevation =  1515.200(Ft.)
Pipe length  =   235.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    27.519(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    27.519(CFS)
Normal flow depth in pipe =   20.30(In.)
Flow top width inside pipe =   17.34(In.)
Critical Depth =   21.83(In.)
Pipe flow velocity =      9.71(Ft/s)
Travel time through pipe =    0.40 min.
Time of concentration (TC) =    19.07 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      414.000 to Point/Station      424.000
```

**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 40.110(Ac.)
Runoff from this stream = 27.519(CFS)
Time of concentration = 19.07 min.
Rainfall intensity = 1.010(In/Hr)

++
Process from Point/Station 408.000 to Point/Station 425.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 597.000(Ft.)
Top (of initial area) elevation = 1533.500(Ft.)
Bottom (of initial area) elevation = 1525.600(Ft.)
Difference in elevation = 7.900(Ft.)
Slope = 0.01323 s(percent)= 1.32
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.943 min.
Rainfall intensity = 1.294(In/Hr) for a 2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.663
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.400
RI index for soil(AMC 1) = 48.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 2.512(CFS)
Total initial stream area = 2.930(Ac.)
Pervious area fraction = 0.500

++
Process from Point/Station 425.000 to Point/Station 424.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1519.600(Ft.)
Downstream point/station elevation = 1515.200(Ft.)
Pipe length = 63.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.512(CFS)
Nearest computed pipe diameter = 9.00(In.)
Calculated individual pipe flow = 2.512(CFS)
Normal flow depth in pipe = 4.89(In.)
Flow top width inside pipe = 8.97(In.)
Critical Depth = 8.32(In.)
Pipe flow velocity = 10.24(Ft/s)
Travel time through pipe = 0.10 min.
Time of concentration (TC) = 12.05 min.

++
Process from Point/Station 425.000 to Point/Station 424.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 2.930(Ac.)
Runoff from this stream = 2.512(CFS)
Time of concentration = 12.05 min.
Rainfall intensity = 1.288(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	27.519	19.07	1.010
2	2.512	12.05	1.288

Largest stream flow has longer time of concentration
Qp = 27.519 + sum of

```
          Qb         Ia/Ib
           2.512 *    0.784 =      1.969
Qp =     29.489

Total of 2 streams to confluence:
Flow rates before confluence point:
      27.519       2.512
Area of streams before confluence:
       40.110        2.930
Results of confluence:
Total flow rate =     29.489(CFS)
Time of concentration =    19.068 min.
Effective stream area after confluence =     43.040(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      424.000 to Point/Station      426.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1515.200(Ft.)
Downstream point/station elevation =  1515.100(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    29.489(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    29.489(CFS)
Normal flow depth in pipe =   25.08(In.)
Flow top width inside pipe =   22.22(In.)
Critical Depth =   22.22(In.)
Pipe flow velocity =      6.73(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    19.12 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      424.000 to Point/Station      426.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     43.040(Ac.)
Runoff from this stream =     29.489(CFS)
Time of concentration =   19.12 min.
Rainfall intensity =     1.008(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      416.000 to Point/Station      427.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   708.000(Ft.)
Top (of initial area) elevation =  1530.400(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     4.700(Ft.)
Slope =    0.00664  s(percent)=       0.66
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.678 min.
Rainfall intensity =      1.160(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.640
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.443(CFS)
Total initial stream area =        4.640(Ac.)
Pervious area fraction = 0.500
```

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Process from Point/Station      427.000 to Point/Station      428.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =  1525.700(Ft.)
End of street segment elevation =  1521.200(Ft.)
Length of street segment  =   760.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      4.137(CFS)
Depth of flow =   0.347(Ft.), Average velocity =   2.301(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.089(Ft.)
Flow velocity =   2.30(Ft/s)
Travel time =    5.51 min.     TC =   20.18  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.672
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      0.980(In/Hr) for a     2.0 year storm
Subarea runoff =      1.304(CFS) for      1.980(Ac.)
Total runoff =      4.747(CFS)       Total area =       6.620(Ac.)
Street flow at end of street =      4.747(CFS)
Half street flow at end of street =      4.747(CFS)
Depth of flow =   0.361(Ft.), Average velocity =   2.379(Ft/s)
Flow width (from curb towards crown)=  13.823(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      428.000 to Point/Station      429.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1518.000(Ft.)
Downstream point/station elevation =  1515.000(Ft.)
Pipe length  =    52.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.747(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.747(CFS)
Normal flow depth in pipe =    6.39(In.)
Flow top width inside pipe =   11.98(In.)
Critical Depth =   10.83(In.)
Pipe flow velocity =     11.18(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    20.26 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      428.000 to Point/Station      429.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.620(Ac.)
Runoff from this stream =      4.747(CFS)
Time of concentration =   20.26 min.
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Rainfall intensity =     0.978(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       29.489     19.12               1.008
2        4.747     20.26               0.978
Largest stream flow has longer or shorter time of concentration
Qp =     29.489 + sum of
          Qa          Tb/Ta
           4.747 *    0.944 =      4.479
Qp =     33.968

Total of 2 main streams to confluence:
Flow rates before confluence point:
      29.489       4.747
Area of streams before confluence:
       43.040        6.620


Results of confluence:
Total flow rate =     33.968(CFS)
Time of concentration =    19.117 min.
Effective stream area after confluence  =     49.660(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      428.000 to Point/Station      429.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.486
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.700
RI index for soil(AMC 1)  =  60.84
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    19.12 min.
Rainfall intensity =      1.008(In/Hr) for a     2.0 year storm
Subarea runoff =      2.378(CFS) for      4.850(Ac.)
Total runoff =     36.346(CFS)       Total area =      54.510(Ac.)
End of computations, total study area =           54.51 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.550
Area averaged RI index number =  65.7
```

- Area 'D' – 10 Year Post-Development Condition – Rational Method

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 05/18/21 File:PRD010.out

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
DEVELOPED CONDITION RATIONAL METHOD - 10 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6407

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.550(In.)
100 year, 1 hour precipitation = 1.300(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.859(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 470.000 to Point/Station 471.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 1566.100(Ft.)
Bottom (of initial area) elevation = 1546.000(Ft.)
Difference in elevation = 20.100(Ft.)
Slope = 0.02010 s(percent)= 2.01
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.503 min.
Rainfall intensity = 1.893(In/Hr) for a 10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.740
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 56.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 7.335(CFS)
Total initial stream area = 5.240(Ac.)
Pervious area fraction = 0.500

++

Process from Point/Station 471.000 to Point/Station 439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1538.000(Ft.)
Downstream point/station elevation = 1533.400(Ft.)
Pipe length = 353.00(Ft.) Manning's N = 0.013

```
No. of pipes = 1  Required pipe flow  =     7.335(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     7.335(CFS)
Normal flow depth in pipe =   12.23(In.)
Flow top width inside pipe =   11.63(In.)
Critical Depth =   12.96(In.)
Pipe flow velocity =      6.85(Ft/s)
Travel time through pipe =    0.86 min.
Time of concentration (TC) =    14.36 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      471.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      5.240(Ac.)
Runoff from this stream =      7.335(CFS)
Time of concentration =   14.36 min.
Rainfall intensity =     1.832(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      473.000 to Point/Station      443.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   759.000(Ft.)
Top (of initial area) elevation =  1552.000(Ft.)
Bottom (of initial area) elevation =  1539.800(Ft.)
Difference in elevation =    12.200(Ft.)
Slope =    0.01607  s(percent)=       1.61
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.646 min.
Rainfall intensity =      1.960(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.743
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      6.015(CFS)
Total initial stream area =        4.130(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      443.000 to Point/Station      439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    28.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.015(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.015(CFS)
Normal flow depth in pipe =    9.96(In.)
Flow top width inside pipe =   14.17(In.)
Critical Depth =   11.89(In.)
Pipe flow velocity =      6.96(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    12.71 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      443.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.130(Ac.)
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Runoff from this stream =      6.015(CFS)
Time of concentration =   12.71 min.
Rainfall intensity =     1.954(In/Hr)


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Process from Point/Station      474.000 to Point/Station      441.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =    96.000(Ft.)
Top (of initial area) elevation =  1543.200(Ft.)
Bottom (of initial area) elevation =  1539.800(Ft.)
Difference in elevation =     3.400(Ft.)
Slope =    0.03542  s(percent)=       3.54
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      3.204(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.845
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.271(CFS)
Total initial stream area =        0.100(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      441.000 to Point/Station      439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    31.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.271(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.271(CFS)
Normal flow depth in pipe =    2.74(In.)
Flow top width inside pipe =    5.98(In.)
Critical Depth =    3.15(In.)
Pipe flow velocity =      3.12(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =     5.17 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      441.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      0.100(Ac.)
Runoff from this stream =      0.271(CFS)
Time of concentration =    5.17 min.
Rainfall intensity =     3.149(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        7.335     14.36                1.832
2        6.015     12.71                1.954
3        0.271      5.17                3.149
Largest stream flow has longer time of concentration
Qp =      7.335 + sum of
          Qb         Ia/Ib
```

```
          6.015 *    0.937 =      5.638
         Qb         Ia/Ib
          0.271 *    0.582 =      0.158
Qp =     13.131

Total of 3 streams to confluence:
Flow rates before confluence point:
       7.335       6.015       0.271
Area of streams before confluence:
        5.240       4.130       0.100
Results of confluence:
Total flow rate =     13.131(CFS)
Time of concentration =    14.362 min.
Effective stream area after confluence =      9.470(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      439.000 to Point/Station      444.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1533.400(Ft.)
Downstream point/station elevation =  1532.500(Ft.)
Pipe length  =    72.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.131(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    13.131(CFS)
Normal flow depth in pipe =   13.45(In.)
Flow top width inside pipe =   20.15(In.)
Critical Depth =   16.19(In.)
Pipe flow velocity =      8.06(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    14.51 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      439.000 to Point/Station      444.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      9.470(Ac.)
Runoff from this stream =     13.131(CFS)
Time of concentration =   14.51 min.
Rainfall intensity =     1.822(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      445.000 to Point/Station      446.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =    42.000(Ft.)
Top (of initial area) elevation =  1540.500(Ft.)
Bottom (of initial area) elevation =  1539.400(Ft.)
Difference in elevation =     1.100(Ft.)
Slope =    0.02619  s(percent)=       2.62
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      3.204(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.789
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.152(CFS)
Total initial stream area =        0.060(Ac.)
```

```
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      446.000 to Point/Station      447.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.152(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.152(CFS)
Normal flow depth in pipe =    1.51(In.)
Flow top width inside pipe =    9.98(In.)
Critical Depth =    1.72(In.)
Pipe flow velocity =      2.13(Ft/s)
Travel time through pipe =    0.31 min.
Time of concentration (TC) =     5.31 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      446.000 to Point/Station      447.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.060(Ac.)
Runoff from this stream =      0.152(CFS)
Time of concentration =    5.31 min.
Rainfall intensity =     3.103(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      448.000 to Point/Station      449.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   640.000(Ft.)
Top (of initial area) elevation =  1587.200(Ft.)
Bottom (of initial area) elevation =  1540.300(Ft.)
Difference in elevation =    46.900(Ft.)
Slope =    0.07328  s(percent)=       7.33
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.876 min.
Rainfall intensity =      1.737(In/Hr) for a    10.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.709
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  74.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.751(CFS)
Total initial stream area =        0.610(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      449.000 to Point/Station      447.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    35.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.751(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.751(CFS)
Normal flow depth in pipe =    3.15(In.)
Flow top width inside pipe =   13.68(In.)
Critical Depth =    3.85(In.)
Pipe flow velocity =      3.61(Ft/s)
```

```
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    16.04 min.


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Process from Point/Station      449.000 to Point/Station      447.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      0.610(Ac.)
Runoff from this stream =      0.751(CFS)
Time of concentration =   16.04 min.
Rainfall intensity =     1.728(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        0.152      5.31                3.103
2        0.751     16.04                1.728
Largest stream flow has longer time of concentration
Qp =      0.751 + sum of
          Qb         Ia/Ib
           0.152 *    0.557 =      0.084
Qp =      0.836

Total of 2 streams to confluence:
Flow rates before confluence point:
       0.152       0.751
Area of streams before confluence:
        0.060        0.610
Results of confluence:
Total flow rate =      0.836(CFS)
Time of concentration =    16.037 min.
Effective stream area after confluence =      0.670(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      447.000 to Point/Station      444.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.400(Ft.)
Downstream point/station elevation =  1532.500(Ft.)
Pipe length  =    89.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.836(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =     0.836(CFS)
Normal flow depth in pipe =    3.14(In.)
Flow top width inside pipe =   16.19(In.)
Critical depth could not be calculated.
Pipe flow velocity =      3.44(Ft/s)
Travel time through pipe =    0.43 min.
Time of concentration (TC) =    16.47 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      447.000 to Point/Station      444.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.670(Ac.)
Runoff from this stream =      0.836(CFS)
Time of concentration =   16.47 min.
Rainfall intensity =     1.704(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1       13.131     14.51               1.822
2        0.836     16.47               1.704
Largest stream flow has longer or shorter time of concentration
Qp =     13.131 + sum of
          Qa          Tb/Ta
           0.836 *    0.881 =      0.736
Qp =     13.868

Total of 2 main streams to confluence:
Flow rates before confluence point:
      13.131       0.836
Area of streams before confluence:
        9.470        0.670


Results of confluence:
Total flow rate =     13.868(CFS)
Time of concentration =    14.511 min.
Effective stream area after confluence  =     10.140(Ac.)


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Process from Point/Station      444.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1532.500(Ft.)
Downstream point/station elevation =  1532.000(Ft.)
Pipe length  =    46.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.868(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =    13.868(CFS)
Normal flow depth in pipe =   13.23(In.)
Flow top width inside pipe =   23.87(In.)
Critical Depth =   16.11(In.)
Pipe flow velocity =      7.81(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =    14.61 min.


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Process from Point/Station      444.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     10.140(Ac.)
Runoff from this stream =     13.868(CFS)
Time of concentration =   14.61 min.
Rainfall intensity =     1.815(In/Hr)


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Process from Point/Station      451.000 to Point/Station      452.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   388.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1540.100(Ft.)
Difference in elevation =     3.700(Ft.)
Slope =    0.00954  s(percent)=       0.95
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.733 min.
Rainfall intensity =      2.137(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.752
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
```

```
Initial subarea runoff =      0.418(CFS)
Total initial stream area =        0.260(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      452.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1532.700(Ft.)
Downstream point/station elevation =  1532.000(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.418(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.418(CFS)
Normal flow depth in pipe =    2.12(In.)
Flow top width inside pipe =   11.60(In.)
Critical Depth =    2.85(In.)
Pipe flow velocity =      3.58(Ft/s)
Travel time through pipe =    0.18 min.
Time of concentration (TC) =    10.91 min.


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Process from Point/Station      452.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.260(Ac.)
Runoff from this stream =      0.418(CFS)
Time of concentration =   10.91 min.
Rainfall intensity =     2.119(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       13.868     14.61                1.815
2        0.418     10.91                2.119
Largest stream flow has longer time of concentration
Qp =     13.868 + sum of
          Qb         Ia/Ib
           0.418 *    0.857 =      0.358
Qp =     14.226

Total of 2 streams to confluence:
Flow rates before confluence point:
      13.868       0.418
Area of streams before confluence:
       10.140        0.260
Results of confluence:
Total flow rate =     14.226(CFS)
Time of concentration =    14.609 min.
Effective stream area after confluence =     10.400(Ac.)


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Process from Point/Station      450.000 to Point/Station      459.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1526.000(Ft.)
Pipe length  =   418.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.226(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    14.226(CFS)
Normal flow depth in pipe =   10.28(In.)
Flow top width inside pipe =   32.52(In.)
Critical Depth =   14.40(In.)
Pipe flow velocity =      8.54(Ft/s)
```

```
Travel time through pipe =    0.82 min.
Time of concentration (TC) =    15.42 min.


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Process from Point/Station      450.000 to Point/Station      459.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     10.400(Ac.)
Runoff from this stream =     14.226(CFS)
Time of concentration =   15.42 min.
Rainfall intensity =     1.764(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      418.000 to Point/Station      419.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------------
Initial area flow distance =   332.000(Ft.)
Top (of initial area) elevation =  1544.200(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01566  s(percent)=       1.57
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.132 min.
Rainfall intensity =      2.329(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.828
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.641(CFS)
Total initial stream area =        1.370(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      419.000 to Point/Station      459.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1531.000(Ft.)
Downstream point/station elevation =  1526.000(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.641(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     2.641(CFS)
Normal flow depth in pipe =    3.50(In.)
Flow top width inside pipe =   14.24(In.)
Critical Depth =    7.38(In.)
Pipe flow velocity =     10.94(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =     9.21 min.


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Process from Point/Station      419.000 to Point/Station      459.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.370(Ac.)
Runoff from this stream =      2.641(CFS)
Time of concentration =    9.21 min.
Rainfall intensity =     2.318(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1       14.226     15.42                 1.764
2        2.641      9.21                 2.318
Largest stream flow has longer time of concentration
Qp =     14.226 + sum of
          Qb         Ia/Ib
           2.641 *    0.761 =      2.010
Qp =     16.236

Total of 2 streams to confluence:
Flow rates before confluence point:
      14.226       2.641
Area of streams before confluence:
       10.400        1.370
Results of confluence:
Total flow rate =     16.236(CFS)
Time of concentration =    15.424 min.
Effective stream area after confluence =     11.770(Ac.)


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Process from Point/Station      459.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1526.000(Ft.)
Downstream point/station elevation =  1523.700(Ft.)
Pipe length  =   316.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    16.236(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    16.236(CFS)
Normal flow depth in pipe =   13.16(In.)
Flow top width inside pipe =   34.67(In.)
Critical Depth =   15.44(In.)
Pipe flow velocity =      6.94(Ft/s)
Travel time through pipe =    0.76 min.
Time of concentration (TC) =    16.18 min.


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Process from Point/Station      459.000 to Point/Station      420.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     11.770(Ac.)
Runoff from this stream =     16.236(CFS)
Time of concentration =   16.18 min.
Rainfall intensity =     1.719(In/Hr)


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Process from Point/Station      421.000 to Point/Station      422.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   508.000(Ft.)
Top (of initial area) elevation =  1541.200(Ft.)
Bottom (of initial area) elevation =  1535.400(Ft.)
Difference in elevation =     5.800(Ft.)
Slope =    0.01142  s(percent)=       1.14
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.532 min.
Rainfall intensity =      2.058(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.793
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.600
RI index for soil(AMC 2)  =  67.40
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      4.567(CFS)
```

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Total initial stream area =        2.800(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      422.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1528.300(Ft.)
Downstream point/station elevation =  1523.700(Ft.)
Pipe length  =    52.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.567(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     4.567(CFS)
Normal flow depth in pipe =    4.65(In.)
Flow top width inside pipe =   15.76(In.)
Critical Depth =    9.84(In.)
Pipe flow velocity =     12.63(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    11.60 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      422.000 to Point/Station      420.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.800(Ac.)
Runoff from this stream =      4.567(CFS)
Time of concentration =   11.60 min.
Rainfall intensity =     2.051(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       16.236     16.18                1.719
2        4.567     11.60                2.051
Largest stream flow has longer time of concentration
Qp =     16.236 + sum of
          Qb         Ia/Ib
           4.567 *    0.838 =      3.828
Qp =     20.064

Total of 2 streams to confluence:
Flow rates before confluence point:
      16.236       4.567
Area of streams before confluence:
       11.770        2.800
Results of confluence:
Total flow rate =     20.064(CFS)
Time of concentration =    16.183 min.
Effective stream area after confluence =     14.570(Ac.)


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Process from Point/Station      420.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1523.700(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =   350.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.064(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    20.064(CFS)
Normal flow depth in pipe =   14.53(In.)
Flow top width inside pipe =   35.33(In.)
Critical Depth =   17.24(In.)
Pipe flow velocity =      7.51(Ft/s)
Travel time through pipe =    0.78 min.
```

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Time of concentration (TC) =    16.96 min.


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Process from Point/Station      420.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     14.570(Ac.)
Runoff from this stream =     20.064(CFS)
Time of concentration =   16.96 min.
Rainfall intensity =     1.677(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      415.000 to Point/Station      416.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1545.700(Ft.)
Bottom (of initial area) elevation =  1530.400(Ft.)
Difference in elevation =    15.300(Ft.)
Slope =    0.01530  s(percent)=       1.53
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.260 min.
Rainfall intensity =      1.839(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.798
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.200
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.800
RI index for soil(AMC 2)  =  71.20
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      5.267(CFS)
Total initial stream area =        3.590(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      416.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1523.300(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =    26.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.267(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     5.267(CFS)
Normal flow depth in pipe =    5.00(In.)
Flow top width inside pipe =   16.12(In.)
Critical Depth =   10.62(In.)
Pipe flow velocity =     13.15(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    14.29 min.


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Process from Point/Station      416.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.590(Ac.)
Runoff from this stream =      5.267(CFS)
Time of concentration =   14.29 min.
Rainfall intensity =     1.836(In/Hr)


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Process from Point/Station      421.000 to Point/Station      423.000
**** INITIAL AREA EVALUATION ****
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Initial area flow distance =   790.000(Ft.)
Top (of initial area) elevation =  1541.200(Ft.)
Bottom (of initial area) elevation =  1530.400(Ft.)
Difference in elevation =    10.800(Ft.)
Slope =    0.01367  s(percent)=       1.37
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.273 min.
Rainfall intensity =      1.910(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.748
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.900
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.100
RI index for soil(AMC 2)  =  57.90
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.716(CFS)
Total initial stream area =        1.900(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      423.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1523.300(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =    24.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.716(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     2.716(CFS)
Normal flow depth in pipe =    3.52(In.)
Flow top width inside pipe =   14.27(In.)
Critical Depth =    7.50(In.)
Pipe flow velocity =     11.16(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    13.31 min.


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Process from Point/Station      423.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      1.900(Ac.)
Runoff from this stream =      2.716(CFS)
Time of concentration =   13.31 min.
Rainfall intensity =     1.907(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       20.064     16.96                 1.677
2        5.267     14.29                 1.836
3        2.716     13.31                 1.907
Largest stream flow has longer time of concentration
Qp =     20.064 + sum of
          Qb         Ia/Ib
           5.267 *    0.913 =      4.810
          Qb         Ia/Ib
           2.716 *    0.879 =      2.389
Qp =     27.263

Total of 3 streams to confluence:
Flow rates before confluence point:
      20.064       5.267       2.716
Area of streams before confluence:
       14.570        3.590        1.900
```

```
Results of confluence:
Total flow rate =     27.263(CFS)
Time of concentration =    16.960 min.
Effective stream area after confluence =     20.060(Ac.)


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Process from Point/Station      417.000 to Point/Station      414.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1521.000(Ft.)
Downstream point/station elevation =  1518.500(Ft.)
Pipe length  =   388.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    27.263(CFS)
Given pipe size =     48.00(In.)
Calculated individual pipe flow  =    27.263(CFS)
Normal flow depth in pipe =   15.89(In.)
Flow top width inside pipe =   45.18(In.)
Critical Depth =   18.52(In.)
Pipe flow velocity =      7.51(Ft/s)
Travel time through pipe =    0.86 min.
Time of concentration (TC) =    17.82 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      417.000 to Point/Station      414.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     20.060(Ac.)
Runoff from this stream =     27.263(CFS)
Time of concentration =   17.82 min.
Rainfall intensity =     1.634(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   490.000(Ft.)
Top (of initial area) elevation =  1545.600(Ft.)
Bottom (of initial area) elevation =  1540.400(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01061  s(percent)=       1.06
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.534 min.
Rainfall intensity =      2.057(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.774
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  62.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.882(CFS)
Total initial stream area =        1.810(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      401.000 to Point/Station      402.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =  1540.400(Ft.)
End of street segment elevation =  1532.700(Ft.)
Length of street segment  =   763.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
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Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      6.220(CFS)
Depth of flow =   0.362(Ft.), Average velocity =   3.108(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.842(Ft.)
Flow velocity =   3.11(Ft/s)
Travel time =    4.09 min.     TC =   15.63  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.777
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.300
RI index for soil(AMC 2)  =  66.90
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.752(In/Hr) for a    10.0 year storm
Subarea runoff =      6.600(CFS) for      4.850(Ac.)
Total runoff =      9.483(CFS)       Total area =       6.660(Ac.)
Street flow at end of street =      9.483(CFS)
Half street flow at end of street =      9.483(CFS)
Depth of flow =   0.412(Ft.), Average velocity =   3.445(Ft/s)
Flow width (from curb towards crown)=  16.333(Ft.)


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Process from Point/Station      402.000 to Point/Station      403.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =  1532.700(Ft.)
End of street segment elevation =  1529.300(Ft.)
Length of street segment  =   380.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     10.531(CFS)
Depth of flow =   0.433(Ft.), Average velocity =   3.378(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  17.414(Ft.)
Flow velocity =   3.38(Ft/s)
Travel time =    1.87 min.     TC =   17.50  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.739
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.100
RI index for soil(AMC 2)  =  59.20
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.650(In/Hr) for a    10.0 year storm
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Subarea runoff =      2.011(CFS) for      1.650(Ac.)
Total runoff =     11.494(CFS)        Total area =       8.310(Ac.)
Street flow at end of street =     11.494(CFS)
Half street flow at end of street =     11.494(CFS)
Depth of flow =   0.445(Ft.), Average velocity =   3.452(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station      403.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    35.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.494(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =    11.494(CFS)
Normal flow depth in pipe =   11.88(In.)
Flow top width inside pipe =   17.05(In.)
Critical Depth =   15.51(In.)
Pipe flow velocity =      9.28(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    17.56 min.


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Process from Point/Station      403.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      8.310(Ac.)
Runoff from this stream =     11.494(CFS)
Time of concentration =   17.56 min.
Rainfall intensity =     1.646(In/Hr)


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Process from Point/Station      400.000 to Point/Station      405.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   530.000(Ft.)
Top (of initial area) elevation =  1545.600(Ft.)
Bottom (of initial area) elevation =  1540.600(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.00943  s(percent)=       0.94
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.185 min.
Rainfall intensity =      1.998(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.756
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.200
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  58.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.822(CFS)
Total initial stream area =        2.530(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      405.000 to Point/Station      406.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =  1540.600(Ft.)
End of street segment elevation =  1532.700(Ft.)
Length of street segment  =   777.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
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Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      5.421(CFS)
Depth of flow =   0.347(Ft.), Average velocity =   3.015(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.088(Ft.)
Flow velocity =   3.01(Ft/s)
Travel time =    4.30 min.     TC =   16.48  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.793
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.600
Decimal fraction soil group D = 0.400
RI index for soil(AMC 2)  =  71.40
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.703(In/Hr) for a    10.0 year storm
Subarea runoff =      3.104(CFS) for      2.300(Ac.)
Total runoff =      6.926(CFS)       Total area =       4.830(Ac.)
Street flow at end of street =      6.926(CFS)
Half street flow at end of street =      6.926(CFS)
Depth of flow =   0.373(Ft.), Average velocity =   3.199(Ft/s)
Flow width (from curb towards crown)=  14.421(Ft.)


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Process from Point/Station      406.000 to Point/Station      407.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =  1532.700(Ft.)
End of street segment elevation =  1529.300(Ft.)
Length of street segment  =   343.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      9.169(CFS)
Depth of flow =   0.409(Ft.), Average velocity =   3.394(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  16.176(Ft.)
Flow velocity =   3.39(Ft/s)
Travel time =    1.68 min.     TC =   18.17  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.761
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.400
RI index for soil(AMC 2)  =  64.90
Pervious area fraction =  0.500; Impervious fraction =  0.500
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Rainfall intensity =      1.617(In/Hr) for a    10.0 year storm
Subarea runoff =      4.395(CFS) for      3.570(Ac.)
Total runoff =     11.321(CFS)        Total area =       8.400(Ac.)
Street flow at end of street =     11.321(CFS)
Half street flow at end of street =     11.321(CFS)
Depth of flow =   0.436(Ft.), Average velocity =   3.574(Ft/s)
Flow width (from curb towards crown)=  17.558(Ft.)


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Process from Point/Station      407.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    36.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.321(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =    11.321(CFS)
Normal flow depth in pipe =    9.94(In.)
Flow top width inside pipe =   23.64(In.)
Critical Depth =   14.49(In.)
Pipe flow velocity =      9.21(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    18.23 min.


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Process from Point/Station      407.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      8.400(Ac.)
Runoff from this stream =     11.321(CFS)
Time of concentration =   18.23 min.
Rainfall intensity =     1.614(In/Hr)


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Process from Point/Station      408.000 to Point/Station      409.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   395.000(Ft.)
Top (of initial area) elevation =  1533.500(Ft.)
Bottom (of initial area) elevation =  1529.200(Ft.)
Difference in elevation =     4.300(Ft.)
Slope =    0.01089  s(percent)=       1.09
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.528 min.
Rainfall intensity =      2.160(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.790
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  65.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.841(CFS)
Total initial stream area =        1.080(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      409.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    45.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.841(CFS)
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Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.841(CFS)
Normal flow depth in pipe =    4.56(In.)
Flow top width inside pipe =   15.66(In.)
Critical Depth =    6.13(In.)
Pipe flow velocity =      5.23(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =    10.67 min.


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Process from Point/Station      409.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      1.080(Ac.)
Runoff from this stream =      1.841(CFS)
Time of concentration =   10.67 min.
Rainfall intensity =     2.144(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       11.494     17.56                1.646
2       11.321     18.23                1.614
3        1.841     10.67                2.144
Largest stream flow has longer or shorter time of concentration
Qp =     11.494 + sum of
          Qa          Tb/Ta
          11.321 *    0.963 =     10.907
          Qb         Ia/Ib
           1.841 *    0.768 =      1.414
Qp =     23.815

Total of 3 streams to confluence:
Flow rates before confluence point:
      11.494      11.321       1.841
Area of streams before confluence:
        8.310        8.400        1.080
Results of confluence:
Total flow rate =     23.815(CFS)
Time of concentration =    17.563 min.
Effective stream area after confluence =     17.790(Ac.)


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Process from Point/Station      404.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1522.100(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =   322.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    23.815(CFS)
Given pipe size =     30.00(In.)
Calculated individual pipe flow  =    23.815(CFS)
Normal flow depth in pipe =   16.15(In.)
Flow top width inside pipe =   29.91(In.)
Critical Depth =   19.95(In.)
Pipe flow velocity =      8.85(Ft/s)
Travel time through pipe =    0.61 min.
Time of concentration (TC) =    18.17 min.


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Process from Point/Station      404.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =     17.790(Ac.)
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Runoff from this stream =     23.815(CFS)
Time of concentration =   18.17 min.
Rainfall intensity =     1.617(In/Hr)


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Process from Point/Station      411.000 to Point/Station      412.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   515.000(Ft.)
Top (of initial area) elevation =  1531.500(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     5.800(Ft.)
Slope =    0.01126  s(percent)=       1.13
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.627 min.
Rainfall intensity =      2.049(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.809
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  72.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.906(CFS)
Total initial stream area =        1.150(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      412.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1518.900(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.906(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.906(CFS)
Normal flow depth in pipe =    5.19(In.)
Flow top width inside pipe =   16.31(In.)
Critical Depth =    6.23(In.)
Pipe flow velocity =      4.51(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    11.70 min.


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Process from Point/Station      412.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      1.150(Ac.)
Runoff from this stream =      1.906(CFS)
Time of concentration =   11.70 min.
Rainfall intensity =     2.042(In/Hr)


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Process from Point/Station      407.000 to Point/Station      413.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   311.000(Ft.)
Top (of initial area) elevation =  1528.400(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     2.700(Ft.)
Slope =    0.00868  s(percent)=       0.87
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.010 min.
Rainfall intensity =      2.218(In/Hr) for a    10.0 year storm
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SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.770
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.200
RI index for soil(AMC 2)  =  59.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.897(CFS)
Total initial stream area =        1.110(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      413.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1518.900(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.897(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.897(CFS)
Normal flow depth in pipe =    5.48(In.)
Flow top width inside pipe =   16.57(In.)
Critical Depth =    6.22(In.)
Pipe flow velocity =      4.16(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =    10.11 min.


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Process from Point/Station      413.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      1.110(Ac.)
Runoff from this stream =      1.897(CFS)
Time of concentration =   10.11 min.
Rainfall intensity =     2.206(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       23.815     18.17                1.617
2        1.906     11.70                2.042
3        1.897     10.11                2.206
Largest stream flow has longer time of concentration
Qp =     23.815 + sum of
          Qb         Ia/Ib
           1.906 *    0.792 =      1.510
          Qb         Ia/Ib
           1.897 *    0.733 =      1.390
Qp =     26.715

Total of 3 streams to confluence:
Flow rates before confluence point:
      23.815       1.906       1.897
Area of streams before confluence:
       17.790        1.150        1.110
Results of confluence:
Total flow rate =     26.715(CFS)
Time of concentration =    18.170 min.
Effective stream area after confluence =     20.050(Ac.)


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Process from Point/Station      410.000 to Point/Station      414.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
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Upstream point/station elevation =  1518.700(Ft.)
Downstream point/station elevation =  1518.500(Ft.)
Pipe length  =    55.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    26.715(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    26.715(CFS)
Normal flow depth in pipe =   23.11(In.)
Flow top width inside pipe =   30.24(In.)
Critical Depth =   20.57(In.)
Pipe flow velocity =      6.01(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    18.32 min.


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Process from Point/Station      410.000 to Point/Station      414.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     20.050(Ac.)
Runoff from this stream =     26.715(CFS)
Time of concentration =   18.32 min.
Rainfall intensity =     1.610(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       27.263     17.82               1.634
2       26.715     18.32               1.610
Largest stream flow has longer or shorter time of concentration
Qp =     27.263 + sum of
          Qa          Tb/Ta
          26.715 *    0.973 =     25.984
Qp =     53.247

Total of 2 main streams to confluence:
Flow rates before confluence point:
      27.263      26.715
Area of streams before confluence:
       20.060       20.050


Results of confluence:
Total flow rate =     53.247(CFS)
Time of concentration =    17.821 min.
Effective stream area after confluence  =     40.110(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      414.000 to Point/Station      424.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1518.500(Ft.)
Downstream point/station elevation =  1515.200(Ft.)
Pipe length  =   235.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    53.247(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    53.247(CFS)
Normal flow depth in pipe =   23.37(In.)
Flow top width inside pipe =   30.01(In.)
Critical Depth =   28.64(In.)
Pipe flow velocity =     11.84(Ft/s)
Travel time through pipe =    0.33 min.
Time of concentration (TC) =    18.15 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station      414.000 to Point/Station      424.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     40.110(Ac.)
Runoff from this stream =     53.247(CFS)
Time of concentration =   18.15 min.
Rainfall intensity =     1.618(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      408.000 to Point/Station      425.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________________
Initial area flow distance =   597.000(Ft.)
Top (of initial area) elevation =  1533.500(Ft.)
Bottom (of initial area) elevation =  1525.600(Ft.)
Difference in elevation =     7.900(Ft.)
Slope =    0.01323  s(percent)=       1.32
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.943 min.
Rainfall intensity =      2.020(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.791
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.400
RI index for soil(AMC 2)  =  67.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      4.684(CFS)
Total initial stream area =        2.930(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      425.000 to Point/Station      424.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  1519.600(Ft.)
Downstream point/station elevation =  1515.200(Ft.)
Pipe length  =    63.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.684(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.684(CFS)
Normal flow depth in pipe =    5.98(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =   10.79(In.)
Pipe flow velocity =     11.97(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    12.03 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      425.000 to Point/Station      424.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.930(Ac.)
Runoff from this stream =      4.684(CFS)
Time of concentration =   12.03 min.
Rainfall intensity =     2.012(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       53.247     18.15                1.618
2        4.684     12.03                2.012
Largest stream flow has longer time of concentration
```

```
Qp =     53.247 + sum of
          Qb         Ia/Ib
           4.684 *    0.804 =      3.767
Qp =     57.014

Total of 2 streams to confluence:
Flow rates before confluence point:
      53.247       4.684
Area of streams before confluence:
       40.110        2.930
Results of confluence:
Total flow rate =     57.014(CFS)
Time of concentration =    18.152 min.
Effective stream area after confluence =     43.040(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      424.000 to Point/Station      426.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1515.200(Ft.)
Downstream point/station elevation =  1515.100(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    57.014(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    57.014(CFS)
Normal flow depth in pipe =   31.17(In.)
Flow top width inside pipe =   31.24(In.)
Critical Depth =   28.91(In.)
Pipe flow velocity =      8.02(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    18.19 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      424.000 to Point/Station      426.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     43.040(Ac.)
Runoff from this stream =     57.014(CFS)
Time of concentration =   18.19 min.
Rainfall intensity =     1.616(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      416.000 to Point/Station      427.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   708.000(Ft.)
Top (of initial area) elevation =  1530.400(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     4.700(Ft.)
Slope =    0.00664  s(percent)=       0.66
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.678 min.
Rainfall intensity =      1.811(In/Hr) for a    10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.774
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 2)  =  65.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      6.505(CFS)
Total initial stream area =        4.640(Ac.)
Pervious area fraction = 0.500
```

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Process from Point/Station      427.000 to Point/Station      428.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
Top of street segment elevation =  1525.700(Ft.)
End of street segment elevation =  1521.200(Ft.)
Length of street segment  =   760.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      7.781(CFS)
Depth of flow =   0.421(Ft.), Average velocity =   2.684(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  16.776(Ft.)
Flow velocity =   2.68(Ft/s)
Travel time =    4.72 min.     TC =   19.40  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.800
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.562(In/Hr) for a    10.0 year storm
Subarea runoff =      2.475(CFS) for      1.980(Ac.)
Total runoff =      8.980(CFS)        Total area =       6.620(Ac.)
Street flow at end of street =      8.980(CFS)
Half street flow at end of street =      8.980(CFS)
Depth of flow =   0.440(Ft.), Average velocity =   2.780(Ft/s)
Flow width (from curb towards crown)=  17.735(Ft.)


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Process from Point/Station      428.000 to Point/Station      429.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1518.000(Ft.)
Downstream point/station elevation =  1515.000(Ft.)
Pipe length  =    52.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.980(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     8.980(CFS)
Normal flow depth in pipe =    8.19(In.)
Flow top width inside pipe =   14.94(In.)
Critical Depth =   13.86(In.)
Pipe flow velocity =     13.10(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    19.46 min.


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Process from Point/Station      428.000 to Point/Station      429.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.620(Ac.)
Runoff from this stream =      8.980(CFS)
```

```
Time of concentration =   19.46 min.
Rainfall intensity =     1.559(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       57.014     18.19               1.616
2        8.980     19.46               1.559
Largest stream flow has longer or shorter time of concentration
Qp =     57.014 + sum of
          Qa          Tb/Ta
           8.980 *    0.935 =      8.394
Qp =     65.407

Total of 2 main streams to confluence:
Flow rates before confluence point:
      57.014       8.980
Area of streams before confluence:
       43.040        6.620


Results of confluence:
Total flow rate =     65.407(CFS)
Time of concentration =    18.193 min.
Effective stream area after confluence  =     49.660(Ac.)


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Process from Point/Station      428.000 to Point/Station      429.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.732
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.700
RI index for soil(AMC 2)  =  78.20
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    18.19 min.
Rainfall intensity =      1.616(In/Hr) for a    10.0 year storm
Subarea runoff =      5.735(CFS) for      4.850(Ac.)
Total runoff =     71.142(CFS)        Total area =      54.510(Ac.)
End of computations, total study area =           54.51 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.550
Area averaged RI index number =  65.7
```

- Area 'D' – 100 Year Post-Development Condition – Rational Method

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 05/18/21 File:PRD100.out

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
DEVELOPED CONDITION RATIONAL METHOD - 100 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6407

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

2 year, 1 hour precipitation = 0.550(In.)
100 year, 1 hour precipitation = 1.300(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.300(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 470.000 to Point/Station 471.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 1566.100(Ft.)
Bottom (of initial area) elevation = 1546.000(Ft.)
Difference in elevation = 20.100(Ft.)
Slope = 0.02010 s(percent)= 2.01
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.503 min.
Rainfall intensity = 2.866(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.839
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 74.80
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 12.599(CFS)
Total initial stream area = 5.240(Ac.)
Pervious area fraction = 0.500

++

Process from Point/Station 471.000 to Point/Station 439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1538.000(Ft.)
Downstream point/station elevation = 1533.400(Ft.)
Pipe length = 353.00(Ft.) Manning's N = 0.013

```
No. of pipes = 1  Required pipe flow  =    12.599(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    12.599(CFS)
Normal flow depth in pipe =   12.90(In.)
Flow top width inside pipe =   20.44(In.)
Critical Depth =   15.86(In.)
Pipe flow velocity =      8.13(Ft/s)
Travel time through pipe =    0.72 min.
Time of concentration (TC) =    14.23 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      471.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      5.240(Ac.)
Runoff from this stream =     12.599(CFS)
Time of concentration =   14.23 min.
Rainfall intensity =     2.788(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      473.000 to Point/Station      443.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   759.000(Ft.)
Top (of initial area) elevation =  1552.000(Ft.)
Bottom (of initial area) elevation =  1539.800(Ft.)
Difference in elevation =    12.200(Ft.)
Slope =    0.01607  s(percent)=       1.61
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.646 min.
Rainfall intensity =      2.967(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.841
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =     10.304(CFS)
Total initial stream area =        4.130(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      443.000 to Point/Station      439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    28.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.304(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.304(CFS)
Normal flow depth in pipe =   12.41(In.)
Flow top width inside pipe =   16.66(In.)
Critical Depth =   14.82(In.)
Pipe flow velocity =      7.93(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    12.70 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      443.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.130(Ac.)
```

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Runoff from this stream =     10.304(CFS)
Time of concentration =   12.70 min.
Rainfall intensity =     2.960(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      474.000 to Point/Station      441.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =    96.000(Ft.)
Top (of initial area) elevation =  1543.200(Ft.)
Bottom (of initial area) elevation =  1539.800(Ft.)
Difference in elevation =     3.400(Ft.)
Slope =    0.03542  s(percent)=       3.54
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      4.852(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.884
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 3)  =  88.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.429(CFS)
Total initial stream area =        0.100(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      441.000 to Point/Station      439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    31.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.429(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.429(CFS)
Normal flow depth in pipe =    3.60(In.)
Flow top width inside pipe =    5.88(In.)
Critical Depth =    4.00(In.)
Pipe flow velocity =      3.48(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =     5.15 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      441.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      0.100(Ac.)
Runoff from this stream =      0.429(CFS)
Time of concentration =    5.15 min.
Rainfall intensity =     4.777(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       12.599     14.23                2.788
2       10.304     12.70                2.960
3        0.429      5.15                4.777
Largest stream flow has longer time of concentration
Qp =     12.599 + sum of
          Qb         Ia/Ib
```

```
         10.304 *    0.942 =      9.704
         Qb         Ia/Ib
          0.429 *    0.584 =      0.250
Qp =     22.553

Total of 3 streams to confluence:
Flow rates before confluence point:
      12.599      10.304       0.429
Area of streams before confluence:
        5.240       4.130       0.100
Results of confluence:
Total flow rate =     22.553(CFS)
Time of concentration =    14.227 min.
Effective stream area after confluence =      9.470(Ac.)


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Process from Point/Station      439.000 to Point/Station      444.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1533.400(Ft.)
Downstream point/station elevation =  1532.500(Ft.)
Pipe length  =    72.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.553(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    22.553(CFS)
Normal flow depth in pipe =   17.67(In.)
Flow top width inside pipe =   21.15(In.)
Critical Depth =   20.31(In.)
Pipe flow velocity =      9.10(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =    14.36 min.


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Process from Point/Station      439.000 to Point/Station      444.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      9.470(Ac.)
Runoff from this stream =     22.553(CFS)
Time of concentration =   14.36 min.
Rainfall intensity =     2.774(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      445.000 to Point/Station      446.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =    42.000(Ft.)
Top (of initial area) elevation =  1540.500(Ft.)
Bottom (of initial area) elevation =  1539.400(Ft.)
Difference in elevation =     1.100(Ft.)
Slope =    0.02619  s(percent)=       2.62
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      4.852(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.862
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.251(CFS)
Total initial stream area =        0.060(Ac.)
```

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Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      446.000 to Point/Station      447.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.251(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.251(CFS)
Normal flow depth in pipe =    1.92(In.)
Flow top width inside pipe =   11.11(In.)
Critical depth could not be calculated.
Pipe flow velocity =      2.48(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =     5.27 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      446.000 to Point/Station      447.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.060(Ac.)
Runoff from this stream =      0.251(CFS)
Time of concentration =    5.27 min.
Rainfall intensity =     4.719(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      448.000 to Point/Station      449.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   640.000(Ft.)
Top (of initial area) elevation =  1587.200(Ft.)
Bottom (of initial area) elevation =  1540.300(Ft.)
Difference in elevation =    46.900(Ft.)
Slope =    0.07328  s(percent)=       7.33
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.876 min.
Rainfall intensity =      2.630(In/Hr) for a   100.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.839
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  87.40
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.346(CFS)
Total initial stream area =        0.610(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      449.000 to Point/Station      447.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    35.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.346(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.346(CFS)
Normal flow depth in pipe =    4.21(In.)
Flow top width inside pipe =   15.24(In.)
Critical Depth =    5.20(In.)
Pipe flow velocity =      4.28(Ft/s)
```

```
Travel time through pipe =    0.14 min.
Time of concentration (TC) =    16.01 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      449.000 to Point/Station      447.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      0.610(Ac.)
Runoff from this stream =      1.346(CFS)
Time of concentration =   16.01 min.
Rainfall intensity =     2.618(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        0.251      5.27                4.719
2        1.346     16.01                2.618
Largest stream flow has longer time of concentration
Qp =      1.346 + sum of
          Qb         Ia/Ib
           0.251 *    0.555 =      0.139
Qp =      1.485

Total of 2 streams to confluence:
Flow rates before confluence point:
       0.251       1.346
Area of streams before confluence:
        0.060        0.610
Results of confluence:
Total flow rate =      1.485(CFS)
Time of concentration =    16.012 min.
Effective stream area after confluence =      0.670(Ac.)


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Process from Point/Station      447.000 to Point/Station      444.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.400(Ft.)
Downstream point/station elevation =  1532.500(Ft.)
Pipe length  =    89.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.485(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =     1.485(CFS)
Normal flow depth in pipe =    4.15(In.)
Flow top width inside pipe =   18.16(In.)
Critical Depth =    5.04(In.)
Pipe flow velocity =      4.08(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =    16.38 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      447.000 to Point/Station      444.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.670(Ac.)
Runoff from this stream =      1.485(CFS)
Time of concentration =   16.38 min.
Rainfall intensity =     2.587(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1       22.553     14.36               2.774
2        1.485     16.38               2.587
Largest stream flow has longer or shorter time of concentration
Qp =     22.553 + sum of
          Qa          Tb/Ta
           1.485 *    0.877 =      1.302
Qp =     23.855

Total of 2 main streams to confluence:
Flow rates before confluence point:
      22.553       1.485
Area of streams before confluence:
        9.470        0.670


Results of confluence:
Total flow rate =     23.855(CFS)
Time of concentration =    14.359 min.
Effective stream area after confluence  =     10.140(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      444.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1532.500(Ft.)
Downstream point/station elevation =  1532.000(Ft.)
Pipe length  =    46.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    23.855(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =    23.855(CFS)
Normal flow depth in pipe =   19.92(In.)
Flow top width inside pipe =   18.03(In.)
Critical Depth =   20.78(In.)
Pipe flow velocity =      8.55(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    14.45 min.


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Process from Point/Station      444.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     10.140(Ac.)
Runoff from this stream =     23.855(CFS)
Time of concentration =   14.45 min.
Rainfall intensity =     2.765(In/Hr)


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Process from Point/Station      451.000 to Point/Station      452.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   388.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1540.100(Ft.)
Difference in elevation =     3.700(Ft.)
Slope =    0.00954  s(percent)=       0.95
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.733 min.
Rainfall intensity =      3.237(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.845
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
```

```
Initial subarea runoff =      0.711(CFS)
Total initial stream area =        0.260(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      452.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1532.700(Ft.)
Downstream point/station elevation =  1532.000(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.711(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.711(CFS)
Normal flow depth in pipe =    2.74(In.)
Flow top width inside pipe =   12.92(In.)
Critical depth could not be calculated.
Pipe flow velocity =      4.20(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    10.88 min.


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Process from Point/Station      452.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.260(Ac.)
Runoff from this stream =      0.711(CFS)
Time of concentration =   10.88 min.
Rainfall intensity =     3.213(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       23.855     14.45                2.765
2        0.711     10.88                3.213
Largest stream flow has longer time of concentration
Qp =     23.855 + sum of
          Qb         Ia/Ib
           0.711 *    0.861 =      0.612
Qp =     24.467

Total of 2 streams to confluence:
Flow rates before confluence point:
      23.855       0.711
Area of streams before confluence:
       10.140        0.260
Results of confluence:
Total flow rate =     24.467(CFS)
Time of concentration =    14.448 min.
Effective stream area after confluence =     10.400(Ac.)


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Process from Point/Station      450.000 to Point/Station      459.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1526.000(Ft.)
Pipe length  =   418.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    24.467(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    24.467(CFS)
Normal flow depth in pipe =   13.66(In.)
Flow top width inside pipe =   34.94(In.)
Critical Depth =   19.15(In.)
Pipe flow velocity =      9.94(Ft/s)
```

```
Travel time through pipe =    0.70 min.
Time of concentration (TC) =    15.15 min.


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Process from Point/Station      450.000 to Point/Station      459.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     10.400(Ac.)
Runoff from this stream =     24.467(CFS)
Time of concentration =   15.15 min.
Rainfall intensity =     2.696(In/Hr)


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Process from Point/Station      418.000 to Point/Station      419.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------------
Initial area flow distance =   332.000(Ft.)
Top (of initial area) elevation =  1544.200(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01566  s(percent)=       1.57
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.132 min.
Rainfall intensity =      3.526(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.878
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 3)  =  88.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      4.241(CFS)
Total initial stream area =        1.370(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      419.000 to Point/Station      459.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1531.000(Ft.)
Downstream point/station elevation =  1526.000(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.241(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     4.241(CFS)
Normal flow depth in pipe =    4.43(In.)
Flow top width inside pipe =   15.51(In.)
Critical Depth =    9.46(In.)
Pipe flow velocity =     12.56(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.20 min.


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Process from Point/Station      419.000 to Point/Station      459.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.370(Ac.)
Runoff from this stream =      4.241(CFS)
Time of concentration =    9.20 min.
Rainfall intensity =     3.511(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1       24.467     15.15                 2.696
2        4.241      9.20                 3.511
Largest stream flow has longer time of concentration
Qp =     24.467 + sum of
          Qb         Ia/Ib
           4.241 *    0.768 =      3.256
Qp =     27.724

Total of 2 streams to confluence:
Flow rates before confluence point:
      24.467       4.241
Area of streams before confluence:
       10.400        1.370
Results of confluence:
Total flow rate =     27.724(CFS)
Time of concentration =    15.149 min.
Effective stream area after confluence =     11.770(Ac.)


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Process from Point/Station      459.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1526.000(Ft.)
Downstream point/station elevation =  1523.700(Ft.)
Pipe length  =   316.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    27.724(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    27.724(CFS)
Normal flow depth in pipe =   17.72(In.)
Flow top width inside pipe =   36.00(In.)
Critical Depth =   20.45(In.)
Pipe flow velocity =      8.00(Ft/s)
Travel time through pipe =    0.66 min.
Time of concentration (TC) =    15.81 min.


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Process from Point/Station      459.000 to Point/Station      420.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     11.770(Ac.)
Runoff from this stream =     27.724(CFS)
Time of concentration =   15.81 min.
Rainfall intensity =     2.636(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      421.000 to Point/Station      422.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   508.000(Ft.)
Top (of initial area) elevation =  1541.200(Ft.)
Bottom (of initial area) elevation =  1535.400(Ft.)
Difference in elevation =     5.800(Ft.)
Slope =    0.01142  s(percent)=       1.14
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.532 min.
Rainfall intensity =      3.116(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.865
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.600
RI index for soil(AMC 3)  =  83.44
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      7.544(CFS)
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Total initial stream area =        2.800(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      422.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1528.300(Ft.)
Downstream point/station elevation =  1523.700(Ft.)
Pipe length  =    52.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.544(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     7.544(CFS)
Normal flow depth in pipe =    6.02(In.)
Flow top width inside pipe =   16.99(In.)
Critical Depth =   12.77(In.)
Pipe flow velocity =     14.56(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    11.59 min.


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Process from Point/Station      422.000 to Point/Station      420.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.800(Ac.)
Runoff from this stream =      7.544(CFS)
Time of concentration =   11.59 min.
Rainfall intensity =     3.107(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       27.724     15.81                2.636
2        7.544     11.59                3.107
Largest stream flow has longer time of concentration
Qp =     27.724 + sum of
          Qb         Ia/Ib
           7.544 *    0.848 =      6.400
Qp =     34.124

Total of 2 streams to confluence:
Flow rates before confluence point:
      27.724       7.544
Area of streams before confluence:
       11.770        2.800
Results of confluence:
Total flow rate =     34.124(CFS)
Time of concentration =    15.808 min.
Effective stream area after confluence =     14.570(Ac.)


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Process from Point/Station      420.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1523.700(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =   350.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    34.124(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    34.124(CFS)
Normal flow depth in pipe =   19.73(In.)
Flow top width inside pipe =   35.83(In.)
Critical Depth =   22.75(In.)
Pipe flow velocity =      8.60(Ft/s)
Travel time through pipe =    0.68 min.
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Time of concentration (TC) =    16.49 min.


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Process from Point/Station      420.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     14.570(Ac.)
Runoff from this stream =     34.124(CFS)
Time of concentration =   16.49 min.
Rainfall intensity =     2.578(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      415.000 to Point/Station      416.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1545.700(Ft.)
Bottom (of initial area) elevation =  1530.400(Ft.)
Difference in elevation =    15.300(Ft.)
Slope =    0.01530  s(percent)=       1.53
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.260 min.
Rainfall intensity =      2.784(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.867
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.200
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.800
RI index for soil(AMC 3)  =  85.72
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      8.663(CFS)
Total initial stream area =        3.590(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      416.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1523.300(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =    26.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.663(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     8.663(CFS)
Normal flow depth in pipe =    6.48(In.)
Flow top width inside pipe =   17.28(In.)
Critical Depth =   13.68(In.)
Pipe flow velocity =     15.12(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    14.29 min.


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Process from Point/Station      416.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.590(Ac.)
Runoff from this stream =      8.663(CFS)
Time of concentration =   14.29 min.
Rainfall intensity =     2.781(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      421.000 to Point/Station      423.000
**** INITIAL AREA EVALUATION ****
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Initial area flow distance =   790.000(Ft.)
Top (of initial area) elevation =  1541.200(Ft.)
Bottom (of initial area) elevation =  1530.400(Ft.)
Difference in elevation =    10.800(Ft.)
Slope =    0.01367  s(percent)=       1.37
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.273 min.
Rainfall intensity =      2.892(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.844
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.900
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.100
RI index for soil(AMC 3)  =  76.32
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      4.636(CFS)
Total initial stream area =        1.900(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      423.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1523.300(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =    24.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.636(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     4.636(CFS)
Normal flow depth in pipe =    4.59(In.)
Flow top width inside pipe =   15.70(In.)
Critical Depth =    9.91(In.)
Pipe flow velocity =     13.05(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    13.30 min.


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Process from Point/Station      423.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      1.900(Ac.)
Runoff from this stream =      4.636(CFS)
Time of concentration =   13.30 min.
Rainfall intensity =     2.888(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       34.124     16.49                 2.578
2        8.663     14.29                 2.781
3        4.636     13.30                 2.888
Largest stream flow has longer time of concentration
Qp =     34.124 + sum of
          Qb         Ia/Ib
           8.663 *    0.927 =      8.030
          Qb         Ia/Ib
           4.636 *    0.893 =      4.138
Qp =     46.292

Total of 3 streams to confluence:
Flow rates before confluence point:
      34.124       8.663       4.636
Area of streams before confluence:
       14.570        3.590        1.900
```

```
Results of confluence:
Total flow rate =     46.292(CFS)
Time of concentration =    16.486 min.
Effective stream area after confluence =     20.060(Ac.)


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Process from Point/Station      417.000 to Point/Station      414.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1521.000(Ft.)
Downstream point/station elevation =  1518.500(Ft.)
Pipe length  =   388.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    46.292(CFS)
Given pipe size =     48.00(In.)
Calculated individual pipe flow  =    46.292(CFS)
Normal flow depth in pipe =   21.16(In.)
Flow top width inside pipe =   47.66(In.)
Critical Depth =   24.45(In.)
Pipe flow velocity =      8.67(Ft/s)
Travel time through pipe =    0.75 min.
Time of concentration (TC) =    17.23 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      417.000 to Point/Station      414.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     20.060(Ac.)
Runoff from this stream =     46.292(CFS)
Time of concentration =   17.23 min.
Rainfall intensity =     2.518(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   490.000(Ft.)
Top (of initial area) elevation =  1545.600(Ft.)
Bottom (of initial area) elevation =  1540.400(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01061  s(percent)=       1.06
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.534 min.
Rainfall intensity =      3.115(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.857
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  80.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      4.830(CFS)
Total initial stream area =        1.810(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      401.000 to Point/Station      402.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =  1540.400(Ft.)
End of street segment elevation =  1532.700(Ft.)
Length of street segment  =   763.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
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Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     10.477(CFS)
Depth of flow =   0.425(Ft.), Average velocity =   3.530(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  16.979(Ft.)
Flow velocity =   3.53(Ft/s)
Travel time =    3.60 min.     TC =   15.14  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.859
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.300
RI index for soil(AMC 3)  =  83.14
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.697(In/Hr) for a   100.0 year storm
Subarea runoff =     11.238(CFS) for      4.850(Ac.)
Total runoff =     16.068(CFS)        Total area =       6.660(Ac.)
Street flow at end of street =     16.068(CFS)
Half street flow at end of street =     16.068(CFS)
Depth of flow =   0.479(Ft.), Average velocity =   4.090(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station      402.000 to Point/Station      403.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =  1532.700(Ft.)
End of street segment elevation =  1529.300(Ft.)
Length of street segment  =   380.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     17.871(CFS)
Depth of flow =   0.502(Ft.), Average velocity =   4.105(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.11(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   4.10(Ft/s)
Travel time =    1.54 min.     TC =   16.68  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.841
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.100
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Decimal fraction soil group D = 0.100
RI index for soil(AMC 3)  =  77.36
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.562(In/Hr) for a   100.0 year storm
Subarea runoff =      3.553(CFS) for      1.650(Ac.)
Total runoff =     19.621(CFS)        Total area =       8.310(Ac.)
Street flow at end of street =     19.621(CFS)
Half street flow at end of street =     19.621(CFS)
Depth of flow =   0.520(Ft.), Average velocity =   4.180(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    1.02(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station      403.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    35.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.621(CFS)
Given pipe size =     18.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
     3.392(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =      1.221(Ft.)
 Minor friction loss =      2.872(Ft.)       K-factor =   1.50
Pipe flow velocity =     11.10(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    16.73 min.


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Process from Point/Station      403.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      8.310(Ac.)
Runoff from this stream =     19.621(CFS)
Time of concentration =   16.73 min.
Rainfall intensity =     2.558(In/Hr)


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Process from Point/Station      400.000 to Point/Station      405.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   530.000(Ft.)
Top (of initial area) elevation =  1545.600(Ft.)
Bottom (of initial area) elevation =  1540.600(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.00943  s(percent)=       0.94
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.185 min.
Rainfall intensity =      3.026(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.847
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.200
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  76.88
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      6.487(CFS)
Total initial stream area =        2.530(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      405.000 to Point/Station      406.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
Top of street segment elevation =  1540.600(Ft.)
End of street segment elevation =  1532.700(Ft.)
Length of street segment  =   777.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      9.139(CFS)
Depth of flow =   0.407(Ft.), Average velocity =   3.424(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  16.076(Ft.)
Flow velocity =   3.42(Ft/s)
Travel time =    3.78 min.     TC =   15.97  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.865
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.600
Decimal fraction soil group D = 0.400
RI index for soil(AMC 3)  =  85.84
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.622(In/Hr) for a   100.0 year storm
Subarea runoff =      5.218(CFS) for      2.300(Ac.)
Total runoff =     11.705(CFS)        Total area =       4.830(Ac.)
Street flow at end of street =     11.705(CFS)
Half street flow at end of street =     11.705(CFS)
Depth of flow =   0.439(Ft.), Average velocity =   3.638(Ft/s)
Flow width (from curb towards crown)=  17.699(Ft.)


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Process from Point/Station      406.000 to Point/Station      407.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
Top of street segment elevation =  1532.700(Ft.)
End of street segment elevation =  1529.300(Ft.)
Length of street segment  =   343.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     15.552(CFS)
Depth of flow =   0.475(Ft.), Average velocity =   4.015(Ft/s)
Note:  depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   4.02(Ft/s)
Travel time =    1.42 min.     TC =   17.39  min.
 Adding area flow to street
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SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.853
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.400
RI index for soil(AMC 3)  =  81.92
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.506(In/Hr) for a   100.0 year storm
Subarea runoff =      7.629(CFS) for      3.570(Ac.)
Total runoff =     19.334(CFS)        Total area =       8.400(Ac.)
Street flow at end of street =     19.334(CFS)
Half street flow at end of street =     19.334(CFS)
Depth of flow =   0.508(Ft.), Average velocity =   4.343(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.38(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station      407.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    36.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.334(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =    19.334(CFS)
Normal flow depth in pipe =   13.57(In.)
Flow top width inside pipe =   23.79(In.)
Critical Depth =   18.98(In.)
Pipe flow velocity =     10.55(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    17.45 min.


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Process from Point/Station      407.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      8.400(Ac.)
Runoff from this stream =     19.334(CFS)
Time of concentration =   17.45 min.
Rainfall intensity =     2.502(In/Hr)


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Process from Point/Station      408.000 to Point/Station      409.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   395.000(Ft.)
Top (of initial area) elevation =  1533.500(Ft.)
Bottom (of initial area) elevation =  1529.200(Ft.)
Difference in elevation =     4.300(Ft.)
Slope =    0.01089  s(percent)=       1.09
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.528 min.
Rainfall intensity =      3.270(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.864
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  82.30
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.050(CFS)
Total initial stream area =        1.080(Ac.)
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Pervious area fraction = 0.500

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Process from Point/Station 409.000 to Point/Station 404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1522.800(Ft.)
Downstream point/station elevation = 1522.100(Ft.)
Pipe length = 45.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 3.050(CFS)
Given pipe size = 18.00(In.)
Calculated individual pipe flow = 3.050(CFS)
Normal flow depth in pipe = 5.91(In.)
Flow top width inside pipe = 16.90(In.)
Critical Depth = 7.97(In.)
Pipe flow velocity = 6.04(Ft/s)
Travel time through pipe = 0.12 min.
Time of concentration (TC) = 10.65 min.

++
Process from Point/Station 409.000 to Point/Station 404.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 2 in normal stream number 3
Stream flow area = 1.080(Ac.)
Runoff from this stream = 3.050(CFS)
Time of concentration = 10.65 min.
Rainfall intensity = 3.250(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	19.621	16.73	2.558
2	19.334	17.45	2.502
3	3.050	10.65	3.250

Largest stream flow has longer or shorter time of concentration
Qp = 19.621 + sum of
Qa Tb/Ta
19.334 * 0.959 = 18.539
Qb Ia/Ib
3.050 * 0.787 = 2.401
Qp = 40.561

Total of 3 streams to confluence:
Flow rates before confluence point:
19.621 19.334 3.050
Area of streams before confluence:
8.310 8.400 1.080
Results of confluence:
Total flow rate = 40.561(CFS)
Time of concentration = 16.732 min.
Effective stream area after confluence = 17.790(Ac.)

++
Process from Point/Station 404.000 to Point/Station 410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

Upstream point/station elevation = 1522.100(Ft.)
Downstream point/station elevation = 1518.700(Ft.)
Pipe length = 322.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 40.561(CFS)
Given pipe size = 30.00(In.)
Calculated individual pipe flow = 40.561(CFS)
Normal flow depth in pipe = 23.63(In.)
Flow top width inside pipe = 24.54(In.)
Critical Depth = 25.69(In.)

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Pipe flow velocity =      9.78(Ft/s)
Travel time through pipe =    0.55 min.
Time of concentration (TC) =    17.28 min.


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Process from Point/Station      404.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 1
Stream flow area =     17.790(Ac.)
Runoff from this stream =     40.561(CFS)
Time of concentration =   17.28 min.
Rainfall intensity =     2.515(In/Hr)


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Process from Point/Station      411.000 to Point/Station      412.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   515.000(Ft.)
Top (of initial area) elevation =  1531.500(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     5.800(Ft.)
Slope =    0.01126  s(percent)=       1.13
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.627 min.
Rainfall intensity =      3.102(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.871
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  86.20
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.107(CFS)
Total initial stream area =        1.150(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      412.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1518.900(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.107(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     3.107(CFS)
Normal flow depth in pipe =    6.71(In.)
Flow top width inside pipe =   17.41(In.)
Critical Depth =    8.04(In.)
Pipe flow velocity =      5.18(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    11.69 min.


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Process from Point/Station      412.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      1.150(Ac.)
Runoff from this stream =      3.107(CFS)
Time of concentration =   11.69 min.
Rainfall intensity =     3.093(In/Hr)


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Process from Point/Station      407.000 to Point/Station      413.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   311.000(Ft.)
Top (of initial area) elevation =  1528.400(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     2.700(Ft.)
Slope =    0.00868  s(percent)=       0.87
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.010 min.
Rainfall intensity =      3.358(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.854
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.200
RI index for soil(AMC 3)  =  77.84
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.185(CFS)
Total initial stream area =        1.110(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      413.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1518.900(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.185(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     3.185(CFS)
Normal flow depth in pipe =    7.22(In.)
Flow top width inside pipe =   17.65(In.)
Critical Depth =    8.14(In.)
Pipe flow velocity =      4.80(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    10.10 min.


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Process from Point/Station      413.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      1.110(Ac.)
Runoff from this stream =      3.185(CFS)
Time of concentration =   10.10 min.
Rainfall intensity =     3.343(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       40.561     17.28                2.515
2        3.107     11.69                3.093
3        3.185     10.10                3.343
Largest stream flow has longer time of concentration
Qp =     40.561 + sum of
          Qb         Ia/Ib
           3.107 *    0.813 =      2.526
          Qb         Ia/Ib
           3.185 *    0.752 =      2.395
Qp =     45.483

Total of 3 streams to confluence:
Flow rates before confluence point:
      40.561       3.107       3.185
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Area of streams before confluence:
       17.790        1.150        1.110
Results of confluence:
Total flow rate =     45.483(CFS)
Time of concentration =    17.281 min.
Effective stream area after confluence =     20.050(Ac.)


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Process from Point/Station      410.000 to Point/Station      414.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  1518.700(Ft.)
Downstream point/station elevation =  1518.500(Ft.)
Pipe length  =    55.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    45.483(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    45.483(CFS)
Normal flow depth in pipe =   29.30(In.)
Flow top width inside pipe =   33.72(In.)
Critical Depth =   25.81(In.)
Pipe flow velocity =      6.80(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =    17.42 min.


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Process from Point/Station      410.000 to Point/Station      414.000
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     20.050(Ac.)
Runoff from this stream =     45.483(CFS)
Time of concentration =   17.42 min.
Rainfall intensity =     2.504(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       46.292     17.23               2.518
2       45.483     17.42               2.504
Largest stream flow has longer or shorter time of concentration
Qp =     46.292 + sum of
          Qa          Tb/Ta
          45.483 *    0.989 =     45.003
Qp =     91.296

Total of 2 main streams to confluence:
Flow rates before confluence point:
      46.292      45.483
Area of streams before confluence:
       20.060       20.050


Results of confluence:
Total flow rate =     91.296(CFS)
Time of concentration =    17.232 min.
Effective stream area after confluence  =     40.110(Ac.)


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Process from Point/Station      414.000 to Point/Station      424.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  1518.500(Ft.)
Downstream point/station elevation =  1515.200(Ft.)
Pipe length  =   235.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    91.296(CFS)
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Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    91.296(CFS)
Normal flow depth in pipe =   29.86(In.)
Flow top width inside pipe =   33.04(In.)
Critical Depth =   35.31(In.)
Pipe flow velocity =     13.40(Ft/s)
Travel time through pipe =    0.29 min.
Time of concentration (TC) =    17.52 min.


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Process from Point/Station      414.000 to Point/Station      424.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     40.110(Ac.)
Runoff from this stream =     91.296(CFS)
Time of concentration =   17.52 min.
Rainfall intensity =     2.496(In/Hr)


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Process from Point/Station      408.000 to Point/Station      425.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   597.000(Ft.)
Top (of initial area) elevation =  1533.500(Ft.)
Bottom (of initial area) elevation =  1525.600(Ft.)
Difference in elevation =     7.900(Ft.)
Slope =    0.01323  s(percent)=       1.32
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.943 min.
Rainfall intensity =      3.058(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.864
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.400
RI index for soil(AMC 3)  =  83.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      7.745(CFS)
Total initial stream area =        2.930(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      425.000 to Point/Station      424.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1519.600(Ft.)
Downstream point/station elevation =  1515.200(Ft.)
Pipe length  =    63.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.745(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     7.745(CFS)
Normal flow depth in pipe =    8.29(In.)
Flow top width inside pipe =   11.10(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.38(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    12.02 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      425.000 to Point/Station      424.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.930(Ac.)
Runoff from this stream =      7.745(CFS)
```

```
Time of concentration =   12.02 min.
Rainfall intensity =     3.048(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       91.296     17.52                2.496
2        7.745     12.02                3.048
Largest stream flow has longer time of concentration
Qp =     91.296 + sum of
          Qb         Ia/Ib
           7.745 *    0.819 =      6.343
Qp =     97.638

Total of 2 streams to confluence:
Flow rates before confluence point:
      91.296       7.745
Area of streams before confluence:
       40.110        2.930
Results of confluence:
Total flow rate =     97.638(CFS)
Time of concentration =    17.524 min.
Effective stream area after confluence =     43.040(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      424.000 to Point/Station      426.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1515.200(Ft.)
Downstream point/station elevation =  1515.100(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    97.638(CFS)
Nearest computed pipe diameter  =     48.00(In.)
Calculated individual pipe flow  =    97.638(CFS)
Normal flow depth in pipe =   37.78(In.)
Flow top width inside pipe =   39.30(In.)
Critical Depth =   35.96(In.)
Pipe flow velocity =      9.21(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    17.56 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      424.000 to Point/Station      426.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     43.040(Ac.)
Runoff from this stream =     97.638(CFS)
Time of concentration =   17.56 min.
Rainfall intensity =     2.493(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      416.000 to Point/Station      427.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   708.000(Ft.)
Top (of initial area) elevation =  1530.400(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     4.700(Ft.)
Slope =    0.00664  s(percent)=       0.66
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.678 min.
Rainfall intensity =      2.742(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
```

```
Runoff Coefficient = 0.857
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 3)  =  82.30
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =     10.908(CFS)
Total initial stream area =        4.640(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      427.000 to Point/Station      428.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1525.700(Ft.)
End of street segment elevation =  1521.200(Ft.)
Length of street segment  =   760.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =     13.017(CFS)
Depth of flow =   0.486(Ft.), Average velocity =   3.203(Ft/s)
Note:  depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   3.20(Ft/s)
Travel time =    3.95 min.     TC =   18.63  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.869
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 3)  =  88.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      2.416(In/Hr) for a   100.0 year storm
Subarea runoff =      4.155(CFS) for      1.980(Ac.)
Total runoff =     15.062(CFS)        Total area =       6.620(Ac.)
Street flow at end of street =     15.062(CFS)
Half street flow at end of street =     15.062(CFS)
Depth of flow =   0.509(Ft.), Average velocity =   3.362(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.45(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      428.000 to Point/Station      429.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1518.000(Ft.)
Downstream point/station elevation =  1515.000(Ft.)
Pipe length  =    52.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.062(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    15.062(CFS)
Normal flow depth in pipe =   11.91(In.)
```

```
Flow top width inside pipe =   12.14(In.)
Critical depth could not be calculated.
Pipe flow velocity =     14.41(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    18.69 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      428.000 to Point/Station      429.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.620(Ac.)
Runoff from this stream =     15.062(CFS)
Time of concentration =   18.69 min.
Rainfall intensity =     2.412(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       97.638     17.56               2.493
2       15.062     18.69               2.412
Largest stream flow has longer or shorter time of concentration
Qp =     97.638 + sum of
          Qa          Tb/Ta
          15.062 *    0.939 =     14.150
Qp =    111.788

Total of 2 main streams to confluence:
Flow rates before confluence point:
      97.638      15.062
Area of streams before confluence:
       43.040        6.620


Results of confluence:
Total flow rate =    111.788(CFS)
Time of concentration =    17.560 min.
Effective stream area after confluence  =     49.660(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      428.000 to Point/Station      429.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.700
RI index for soil(AMC 3)  =  89.92
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    17.56 min.
Rainfall intensity =      2.493(In/Hr) for a   100.0 year storm
Subarea runoff =     10.267(CFS) for      4.850(Ac.)
Total runoff =    122.056(CFS)       Total area =      54.510(Ac.)
End of computations, total study area =           54.51 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.550
Area averaged RI index number =  65.7
```

- Area 'D' – 2 Year - Pre-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/12/21 File: EXD00212.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	0.55	33.02

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	1.30	78.05

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 0.550(In)
Areal adjustment factor = 99.95 %
Adjusted average point rain = 0.550(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
73.4  55.1      0.520     0.000        0.520       1.000      0.520
                                                  Sum (F) =   0.520
Area averaged mean soil loss (F) (In/Hr) =  0.520
Minimum soil loss rate ((In/Hr)) =  0.260
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5300
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083         84.723         14.638             8.857
    2   0.167        169.445         45.868            27.755
    3   0.250        254.168         18.651            11.285
    4   0.333        338.890          7.945             4.808
    5   0.417        423.613          4.722             2.857
    6   0.500        508.335          2.944             1.781
    7   0.583        593.058          2.104             1.273
    8   0.667        677.781          1.405             0.850
    9   0.750        762.503          0.925             0.560
   10   0.833        847.226          0.799             0.483
                             Sum = 100.000   Sum=      60.509
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max    |   Low        (In/Hr)
   1   0.08     3.40      0.224       (  0.520)       0.202        0.022
   2   0.17     4.70      0.310       (  0.520)       0.279        0.031
   3   0.25     4.70      0.310       (  0.520)       0.279        0.031
   4   0.33     5.10      0.336       (  0.520)       0.303        0.034
   5   0.42     5.80      0.383       (  0.520)       0.344        0.038
   6   0.50     5.90      0.389       (  0.520)       0.350        0.039
   7   0.58     7.10      0.468       (  0.520)       0.422        0.047
   8   0.67     8.70      0.574       (  0.520)       0.516        0.057
   9   0.75    13.20      0.871          0.520    (  0.784)        0.351
  10   0.83    29.70      1.959          0.520    (  1.763)        1.439
  11   0.92     7.70      0.508       (  0.520)       0.457        0.051
  12   1.00     4.00      0.264       (  0.520)       0.237        0.026
               (Loss Rate Not Used)
     Sum =     100.0                                  Sum =     2.2
       Flood volume = Effective rainfall      0.18(In)
        times area      60.0(Ac.)/[(In)/(Ft.)] =       0.9(Ac.Ft)
       Total soil loss =      0.37(In)
       Total soil loss =     1.847(Ac.Ft)
       Total rainfall =      0.55(In)
       Flood volume =       39341.8 Cubic Feet
       Total soil loss =       80462.9 Cubic Feet
       ------------------------------------------------------------------
        Peak flow rate of this hydrograph =     44.955(CFS)
       ------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))
```

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.5	25.0	37.5	50.0
0+ 5	0.0014	0.20	Q				
0+10	0.0076	0.90	Q				
0+15	0.0171	1.39	VQ				
0+20	0.0283	1.62	|Q				
0+25	0.0409	1.84	|Q				
0+30	0.0551	2.06	|QV				
0+35	0.0707	2.26	|Q V				
0+40	0.0889	2.64	| QV				
0+45	0.1279	5.66	| QV				
0+50	0.2907	23.64	|	V Q			
0+55	0.6003	44.96	|		V	Q	
1+ 0	0.7376	19.94	|	Q		V	
1+ 5	0.8028	9.46	| Q			V	
1+10	0.8402	5.43	| Q			V	
1+15	0.8635	3.38	| Q			V	
1+20	0.8797	2.35	|Q			V	
1+25	0.8904	1.56	|Q			V	
1+30	0.8977	1.05	Q			V	
1+35	0.9028	0.75	Q			V	
1+40	0.9031	0.04	Q			V	
1+45	0.9032	0.01	Q			V	

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/12/21 File: EXD00232.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	0.85	51.03

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	2.00	120.08

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 0.850(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 0.850(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
73.4	55.1	0.520	0.000	0.520	1.000	0.520
					Sum (F) =	0.520

Area averaged mean soil loss (F) (In/Hr) = 0.520
Minimum soil loss rate ((In/Hr)) = 0.260
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	84.723	14.638	8.857
2	0.167	169.445	45.868	27.755
3	0.250	254.168	18.651	11.285
4	0.333	338.890	7.945	4.808
5	0.417	423.613	4.722	2.857
6	0.500	508.335	2.944	1.781
7	0.583	593.058	2.104	1.273
8	0.667	677.781	1.405	0.850
9	0.750	762.503	0.925	0.560
10	0.833	847.226	0.799	0.483
			Sum = 100.000	Sum= 60.509

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.133	(0.520)	0.119	0.013
2	0.17	1.30	0.133	(0.520)	0.119	0.013
3	0.25	1.10	0.112	(0.520)	0.101	0.011
4	0.33	1.50	0.153	(0.520)	0.138	0.015
5	0.42	1.50	0.153	(0.520)	0.138	0.015
6	0.50	1.80	0.184	(0.520)	0.165	0.018
7	0.58	1.50	0.153	(0.520)	0.138	0.015
8	0.67	1.80	0.184	(0.520)	0.165	0.018
9	0.75	1.80	0.184	(0.520)	0.165	0.018
10	0.83	1.50	0.153	(0.520)	0.138	0.015
11	0.92	1.60	0.163	(0.520)	0.147	0.016
12	1.00	1.80	0.184	(0.520)	0.165	0.018
13	1.08	2.20	0.224	(0.520)	0.202	0.022
14	1.17	2.20	0.224	(0.520)	0.202	0.022
15	1.25	2.20	0.224	(0.520)	0.202	0.022
16	1.33	2.00	0.204	(0.520)	0.184	0.020
17	1.42	2.60	0.265	(0.520)	0.239	0.027
18	1.50	2.70	0.275	(0.520)	0.248	0.028
19	1.58	2.40	0.245	(0.520)	0.220	0.024
20	1.67	2.70	0.275	(0.520)	0.248	0.028
21	1.75	3.30	0.337	(0.520)	0.303	0.034
22	1.83	3.10	0.316	(0.520)	0.285	0.032
23	1.92	2.90	0.296	(0.520)	0.266	0.030
24	2.00	3.00	0.306	(0.520)	0.275	0.031
25	2.08	3.10	0.316	(0.520)	0.285	0.032
26	2.17	4.20	0.428	(0.520)	0.385	0.043
27	2.25	5.00	0.510	(0.520)	0.459	0.051
28	2.33	3.50	0.357	(0.520)	0.321	0.036
29	2.42	6.80	0.693	0.520	(0.624)	0.173
30	2.50	7.30	0.744	0.520	(0.670)	0.224
31	2.58	8.20	0.836	0.520	(0.753)	0.316
32	2.67	5.90	0.602	0.520	(0.541)	0.081

```
33   2.75     2.00      0.204       (  0.520)       0.184        0.020
34   2.83     1.80      0.184       (  0.520)       0.165        0.018
35   2.92     1.80      0.184       (  0.520)       0.165        0.018
36   3.00     0.60      0.061       (  0.520)       0.055        0.006
              (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     1.5
      Flood volume = Effective rainfall      0.13(In)
       times area      60.0(Ac.)/[(In)/(Ft.)] =       0.6(Ac.Ft)
      Total soil loss =      0.72(In)
      Total soil loss =     3.615(Ac.Ft)
      Total rainfall =      0.85(In)
      Flood volume =       27734.9 Cubic Feet
      Total soil loss =      157469.9 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     13.167(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-------------------------------------------------------------------------
  0+ 5       0.0008      0.12  Q         |         |         |         |
  0+10       0.0042      0.49  Q         |         |         |         |
  0+15       0.0084      0.62  VQ        |         |         |         |
  0+20       0.0130      0.66  VQ        |         |         |         |
  0+25       0.0184      0.79  |Q        |         |         |         |
  0+30       0.0244      0.88  |Q        |         |         |         |
  0+35       0.0311      0.96  |Q        |         |         |         |
  0+40       0.0377      0.96  |QV       |         |         |         |
  0+45       0.0448      1.04  | Q       |         |         |         |
  0+50       0.0520      1.05  | QV      |         |         |         |
  0+55       0.0588      0.99  |Q V      |         |         |         |
  1+ 0       0.0658      1.01  | Q V     |         |         |         |
  1+ 5       0.0734      1.10  | Q V     |         |         |         |
  1+10       0.0819      1.24  | Q  V    |         |         |         |
  1+15       0.0908      1.29  | Q  V    |         |         |         |
  1+20       0.0997      1.30  | Q   V   |         |         |         |
  1+25       0.1088      1.31  | Q   V   |         |         |         |
  1+30       0.1189      1.48  | Q    V  |         |         |         |
  1+35       0.1296      1.54  |  Q    V |         |         |         |
  1+40       0.1401      1.53  |  Q    V |         |         |         |
  1+45       0.1515      1.65  |  Q     V|         |         |         |
  1+50       0.1641      1.84  |  Q      V         |         |         |
  1+55       0.1768      1.85  |  Q      |V        |         |         |
  2+ 0       0.1893      1.81  |  Q      |V        |         |         |
  2+ 5       0.2020      1.84  |  Q      | V       |         |         |
  2+10       0.2156      1.98  |  Q      |  V      |         |         |
  2+15       0.2320      2.38  |   Q     |   V     |         |         |
  2+20       0.2500      2.60  |    Q    |    V    |         |         |
  2+25       0.2744      3.55  |      Q  |      V  |         |         |
  2+30       0.3276      7.72  |         |    Q    V         |         |
  2+35       0.4066     11.47  |         |         | Q  V    |         |
  2+40       0.4973     13.17  |         |         |    Q    |V        |
  2+45       0.5509      7.78  |         |    Q    |         |   V     |
  2+50       0.5801      4.25  |       Q |         |         |     V   |
  2+55       0.6001      2.90  |    Q    |         |         |      V  |
  3+ 0       0.6149      2.14  |   Q     |         |         |       V |
  3+ 5       0.6243      1.38  | Q       |         |         |        V|
  3+10       0.6300      0.83  |Q        |         |         |        V|
  3+15       0.6334      0.50  Q         |         |         |        V|
  3+20       0.6354      0.29  Q         |         |         |        V|
  3+25       0.6361      0.10  Q         |         |         |        V|
  3+30       0.6364      0.04  Q         |         |         |        V|
  3+35       0.6366      0.02  Q         |         |         |        V|
  3+40       0.6367      0.01  Q         |         |         |        V|
  3+45       0.6367      0.00  Q         |         |         |        V|
-------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/12/21 File: EXD00262.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	1.20	72.05

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	3.00	180.12

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 1.200(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.200(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
73.4	55.1	0.520	0.000	0.520	1.000	0.520
					Sum (F) =	0.520

Area averaged mean soil loss (F) (In/Hr) = 0.520
Minimum soil loss rate ((In/Hr)) = 0.260
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

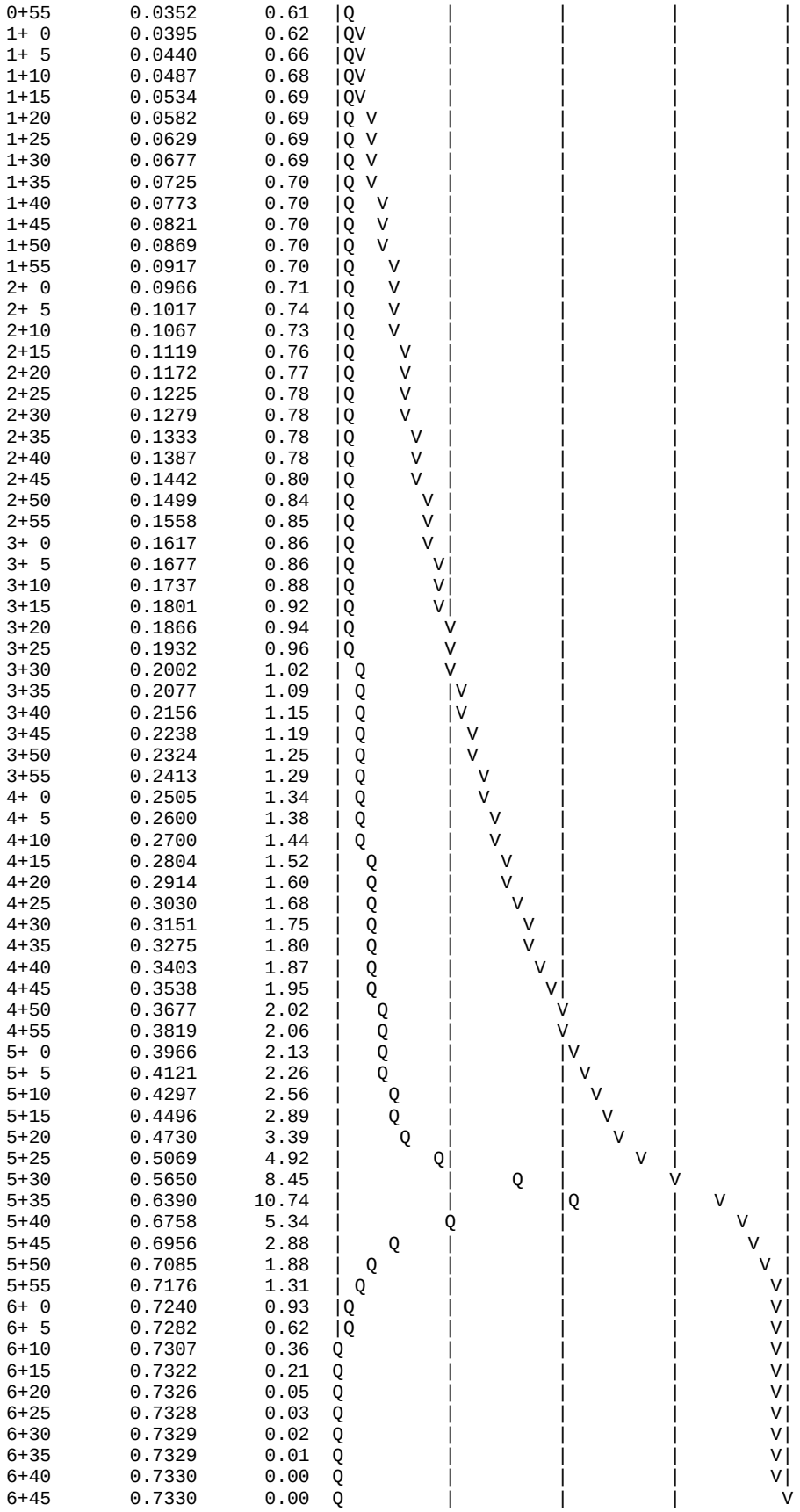
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	84.723	14.638	8.857
2	0.167	169.445	45.868	27.755
3	0.250	254.168	18.651	11.285
4	0.333	338.890	7.945	4.808
5	0.417	423.613	4.722	2.857
6	0.500	508.335	2.944	1.781
7	0.583	593.058	2.104	1.273
8	0.667	677.781	1.405	0.850
9	0.750	762.503	0.925	0.560
10	0.833	847.226	0.799	0.483
			Sum = 100.000	Sum= 60.509

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.072	(0.520)	0.065	0.007
2	0.17	0.60	0.086	(0.520)	0.078	0.009
3	0.25	0.60	0.086	(0.520)	0.078	0.009
4	0.33	0.60	0.086	(0.520)	0.078	0.009
5	0.42	0.60	0.086	(0.520)	0.078	0.009
6	0.50	0.70	0.101	(0.520)	0.091	0.010
7	0.58	0.70	0.101	(0.520)	0.091	0.010
8	0.67	0.70	0.101	(0.520)	0.091	0.010
9	0.75	0.70	0.101	(0.520)	0.091	0.010
10	0.83	0.70	0.101	(0.520)	0.091	0.010
11	0.92	0.70	0.101	(0.520)	0.091	0.010
12	1.00	0.80	0.115	(0.520)	0.104	0.012
13	1.08	0.80	0.115	(0.520)	0.104	0.012
14	1.17	0.80	0.115	(0.520)	0.104	0.012
15	1.25	0.80	0.115	(0.520)	0.104	0.012
16	1.33	0.80	0.115	(0.520)	0.104	0.012
17	1.42	0.80	0.115	(0.520)	0.104	0.012
18	1.50	0.80	0.115	(0.520)	0.104	0.012
19	1.58	0.80	0.115	(0.520)	0.104	0.012
20	1.67	0.80	0.115	(0.520)	0.104	0.012
21	1.75	0.80	0.115	(0.520)	0.104	0.012
22	1.83	0.80	0.115	(0.520)	0.104	0.012
23	1.92	0.80	0.115	(0.520)	0.104	0.012
24	2.00	0.90	0.130	(0.520)	0.117	0.013
25	2.08	0.80	0.115	(0.520)	0.104	0.012
26	2.17	0.90	0.130	(0.520)	0.117	0.013
27	2.25	0.90	0.130	(0.520)	0.117	0.013
28	2.33	0.90	0.130	(0.520)	0.117	0.013
29	2.42	0.90	0.130	(0.520)	0.117	0.013
30	2.50	0.90	0.130	(0.520)	0.117	0.013
31	2.58	0.90	0.130	(0.520)	0.117	0.013
32	2.67	0.90	0.130	(0.520)	0.117	0.013

```
33   2.75     1.00      0.144       (  0.520)       0.130        0.014
34   2.83     1.00      0.144       (  0.520)       0.130        0.014
35   2.92     1.00      0.144       (  0.520)       0.130        0.014
36   3.00     1.00      0.144       (  0.520)       0.130        0.014
37   3.08     1.00      0.144       (  0.520)       0.130        0.014
38   3.17     1.10      0.158       (  0.520)       0.143        0.016
39   3.25     1.10      0.158       (  0.520)       0.143        0.016
40   3.33     1.10      0.158       (  0.520)       0.143        0.016
41   3.42     1.20      0.173       (  0.520)       0.155        0.017
42   3.50     1.30      0.187       (  0.520)       0.168        0.019
43   3.58     1.40      0.202       (  0.520)       0.181        0.020
44   3.67     1.40      0.202       (  0.520)       0.181        0.020
45   3.75     1.50      0.216       (  0.520)       0.194        0.022
46   3.83     1.50      0.216       (  0.520)       0.194        0.022
47   3.92     1.60      0.230       (  0.520)       0.207        0.023
48   4.00     1.60      0.230       (  0.520)       0.207        0.023
49   4.08     1.70      0.245       (  0.520)       0.220        0.024
50   4.17     1.80      0.259       (  0.520)       0.233        0.026
51   4.25     1.90      0.274       (  0.520)       0.246        0.027
52   4.33     2.00      0.288       (  0.520)       0.259        0.029
53   4.42     2.10      0.302       (  0.520)       0.272        0.030
54   4.50     2.10      0.302       (  0.520)       0.272        0.030
55   4.58     2.20      0.317       (  0.520)       0.285        0.032
56   4.67     2.30      0.331       (  0.520)       0.298        0.033
57   4.75     2.40      0.346       (  0.520)       0.311        0.035
58   4.83     2.40      0.346       (  0.520)       0.311        0.035
59   4.92     2.50      0.360       (  0.520)       0.324        0.036
60   5.00     2.60      0.374       (  0.520)       0.337        0.037
61   5.08     3.10      0.446       (  0.520)       0.402        0.045
62   5.17     3.60      0.518       (  0.520)       0.466        0.052
63   5.25     3.90      0.561       (  0.520)       0.505        0.056
64   5.33     4.20      0.605          0.520    (  0.544)        0.084
65   5.42     4.70      0.677          0.520    (  0.609)        0.156
66   5.50     5.60      0.806          0.520    (  0.726)        0.286
67   5.58     1.90      0.274       (  0.520)       0.246        0.027
68   5.67     0.90      0.130       (  0.520)       0.117        0.013
69   5.75     0.60      0.086       (  0.520)       0.078        0.009
70   5.83     0.50      0.072       (  0.520)       0.065        0.007
71   5.92     0.30      0.043       (  0.520)       0.039        0.004
72   6.00     0.20      0.029       (  0.520)       0.026        0.003
             (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     1.8
      Flood volume = Effective rainfall      0.15(In)
       times area      60.0(Ac.)/[(In)/(Ft.)] =       0.7(Ac.Ft)
      Total soil loss =      1.05(In)
      Total soil loss =     5.270(Ac.Ft)
      Total rainfall =      1.20(In)
      Flood volume =       31928.3 Cubic Feet
      Total soil loss =      229552.0 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     10.737(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-------------------------------------------------------------------------
  0+ 5       0.0004      0.06  Q         |         |         |         |
  0+10       0.0023      0.28  Q         |         |         |         |
  0+15       0.0051      0.40  Q         |         |         |         |
  0+20       0.0082      0.45  Q         |         |         |         |
  0+25       0.0115      0.48  Q         |         |         |         |
  0+30       0.0149      0.51  VQ        |         |         |         |
  0+35       0.0188      0.56  |Q        |         |         |         |
  0+40       0.0228      0.58  |Q        |         |         |         |
  0+45       0.0269      0.59  |Q        |         |         |         |
  0+50       0.0310      0.60  |Q        |         |         |         |
```



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       U n i t   H y d r o g r a p h   A n a l y s i s

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              Study date  11/08/21 File: EXD002242.out


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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978


Program License Serial Number 6406

------------------------------------------------------------------------
 English (in-lb) Input Units Used
 English Rainfall Data (Inches) Input Values Used

 English Units used in output format



------------------------------------------------------------------------
TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 2 YEAR  HOUR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
Drainage Area =      60.04(Ac.)  =      0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment =      60.04(Ac.)  =      0.094 Sq. Mi.
Length along longest watercourse =    2506.00(Ft.)
Length along longest watercourse measured to centroid =    1300.00(Ft.)
Length along longest watercourse =      0.475 Mi.
Length along longest watercourse measured to centroid =      0.246 Mi.
Difference in elevation =     230.00(Ft.)
Slope along watercourse =    484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time =    0.098 Hr.
Lag time =     5.90 Min.
25% of lag time =     1.48 Min.
40% of lag time =     2.36 Min.
Unit time =    15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow =     0.00(CFS)

2 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       60.04           2.00                120.08

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       60.04           5.00                300.20

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    2.000(In)
Area Averaged 100-Year Rainfall =    5.000(In)

Point rain (area averaged) =    2.000(In)
Areal adjustment factor =   99.99 %
Adjusted average point rain =    2.000(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    60.040           73.40         0.000
 Total Area Entered =     60.04(Ac.)
```

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
73.4	55.1	0.520	0.000	0.520	1.000	0.520
					Sum (F) =	0.520

Area averaged mean soil loss (F) (In/Hr) = 0.520
Minimum soil loss rate ((In/Hr)) = 0.260
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	254.168	51.434	31.122
2	0.500	508.335	39.798	24.081
3	0.750	762.503	6.885	4.166
4	1.000	1016.671	1.884	1.140
			Sum = 100.000	Sum= 60.509

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.016	(0.919)	0.014	0.002
2	0.50	0.30	0.024	(0.908)	0.022	0.002
3	0.75	0.30	0.024	(0.897)	0.022	0.002
4	1.00	0.40	0.032	(0.887)	0.029	0.003
5	1.25	0.30	0.024	(0.876)	0.022	0.002
6	1.50	0.30	0.024	(0.866)	0.022	0.002
7	1.75	0.30	0.024	(0.856)	0.022	0.002
8	2.00	0.40	0.032	(0.845)	0.029	0.003
9	2.25	0.40	0.032	(0.835)	0.029	0.003
10	2.50	0.40	0.032	(0.825)	0.029	0.003
11	2.75	0.50	0.040	(0.815)	0.036	0.004
12	3.00	0.50	0.040	(0.805)	0.036	0.004
13	3.25	0.50	0.040	(0.795)	0.036	0.004
14	3.50	0.50	0.040	(0.785)	0.036	0.004
15	3.75	0.50	0.040	(0.775)	0.036	0.004
16	4.00	0.60	0.048	(0.765)	0.043	0.005
17	4.25	0.60	0.048	(0.756)	0.043	0.005
18	4.50	0.70	0.056	(0.746)	0.050	0.006
19	4.75	0.70	0.056	(0.736)	0.050	0.006
20	5.00	0.80	0.064	(0.727)	0.058	0.006
21	5.25	0.60	0.048	(0.718)	0.043	0.005
22	5.50	0.70	0.056	(0.708)	0.050	0.006
23	5.75	0.80	0.064	(0.699)	0.058	0.006
24	6.00	0.80	0.064	(0.690)	0.058	0.006
25	6.25	0.90	0.072	(0.681)	0.065	0.007
26	6.50	0.90	0.072	(0.671)	0.065	0.007
27	6.75	1.00	0.080	(0.662)	0.072	0.008
28	7.00	1.00	0.080	(0.654)	0.072	0.008
29	7.25	1.00	0.080	(0.645)	0.072	0.008
30	7.50	1.10	0.088	(0.636)	0.079	0.009
31	7.75	1.20	0.096	(0.627)	0.086	0.010
32	8.00	1.30	0.104	(0.618)	0.094	0.010
33	8.25	1.50	0.120	(0.610)	0.108	0.012
34	8.50	1.50	0.120	(0.601)	0.108	0.012
35	8.75	1.60	0.128	(0.593)	0.115	0.013
36	9.00	1.70	0.136	(0.585)	0.122	0.014
37	9.25	1.90	0.152	(0.576)	0.137	0.015
38	9.50	2.00	0.160	(0.568)	0.144	0.016

39	9.75	2.10	0.168	(	0.560)	0.151	0.017
40	10.00	2.20	0.176	(	0.552)	0.158	0.018
41	10.25	1.50	0.120	(	0.544)	0.108	0.012
42	10.50	1.50	0.120	(	0.536)	0.108	0.012
43	10.75	2.00	0.160	(	0.528)	0.144	0.016
44	11.00	2.00	0.160	(	0.521)	0.144	0.016
45	11.25	1.90	0.152	(	0.513)	0.137	0.015
46	11.50	1.90	0.152	(	0.505)	0.137	0.015
47	11.75	1.70	0.136	(	0.498)	0.122	0.014
48	12.00	1.80	0.144	(	0.490)	0.130	0.014
49	12.25	2.50	0.200	(	0.483)	0.180	0.020
50	12.50	2.60	0.208	(	0.476)	0.187	0.021
51	12.75	2.80	0.224	(	0.469)	0.202	0.022
52	13.00	2.90	0.232	(	0.462)	0.209	0.023
53	13.25	3.40	0.272	(	0.455)	0.245	0.027
54	13.50	3.40	0.272	(	0.448)	0.245	0.027
55	13.75	2.30	0.184	(	0.441)	0.166	0.018
56	14.00	2.30	0.184	(	0.434)	0.166	0.018
57	14.25	2.70	0.216	(	0.428)	0.194	0.022
58	14.50	2.60	0.208	(	0.421)	0.187	0.021
59	14.75	2.60	0.208	(	0.415)	0.187	0.021
60	15.00	2.50	0.200	(	0.408)	0.180	0.020
61	15.25	2.40	0.192	(	0.402)	0.173	0.019
62	15.50	2.30	0.184	(	0.396)	0.166	0.018
63	15.75	1.90	0.152	(	0.390)	0.137	0.015
64	16.00	1.90	0.152	(	0.384)	0.137	0.015
65	16.25	0.40	0.032	(	0.378)	0.029	0.003
66	16.50	0.40	0.032	(	0.372)	0.029	0.003
67	16.75	0.30	0.024	(	0.367)	0.022	0.002
68	17.00	0.30	0.024	(	0.361)	0.022	0.002
69	17.25	0.50	0.040	(	0.356)	0.036	0.004
70	17.50	0.50	0.040	(	0.350)	0.036	0.004
71	17.75	0.50	0.040	(	0.345)	0.036	0.004
72	18.00	0.40	0.032	(	0.340)	0.029	0.003
73	18.25	0.40	0.032	(	0.335)	0.029	0.003
74	18.50	0.40	0.032	(	0.330)	0.029	0.003
75	18.75	0.30	0.024	(	0.325)	0.022	0.002
76	19.00	0.20	0.016	(	0.321)	0.014	0.002
77	19.25	0.30	0.024	(	0.316)	0.022	0.002
78	19.50	0.40	0.032	(	0.312)	0.029	0.003
79	19.75	0.30	0.024	(	0.308)	0.022	0.002
80	20.00	0.20	0.016	(	0.303)	0.014	0.002
81	20.25	0.30	0.024	(	0.299)	0.022	0.002
82	20.50	0.30	0.024	(	0.296)	0.022	0.002
83	20.75	0.30	0.024	(	0.292)	0.022	0.002
84	21.00	0.20	0.016	(	0.288)	0.014	0.002
85	21.25	0.30	0.024	(	0.285)	0.022	0.002
86	21.50	0.20	0.016	(	0.282)	0.014	0.002
87	21.75	0.30	0.024	(	0.279)	0.022	0.002
88	22.00	0.20	0.016	(	0.276)	0.014	0.002
89	22.25	0.30	0.024	(	0.273)	0.022	0.002
90	22.50	0.20	0.016	(	0.270)	0.014	0.002
91	22.75	0.20	0.016	(	0.268)	0.014	0.002
92	23.00	0.20	0.016	(	0.266)	0.014	0.002
93	23.25	0.20	0.016	(	0.264)	0.014	0.002
94	23.50	0.20	0.016	(	0.262)	0.014	0.002
95	23.75	0.20	0.016	(	0.261)	0.014	0.002
96	24.00	0.20	0.016	(	0.260)	0.014	0.002

(Loss Rate Not Used)

Sum = 100.0 Sum = 0.8

Flood volume = Effective rainfall 0.20(In)
times area 60.0(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)
Total soil loss = 1.80(In)
Total soil loss = 9.005(Ac.Ft)
Total rainfall = 2.00(In)
Flood volume = 43583.9 Cubic Feet
Total soil loss = 392255.4 Cubic Feet

Peak flow rate of this hydrograph = 1.624(CFS)

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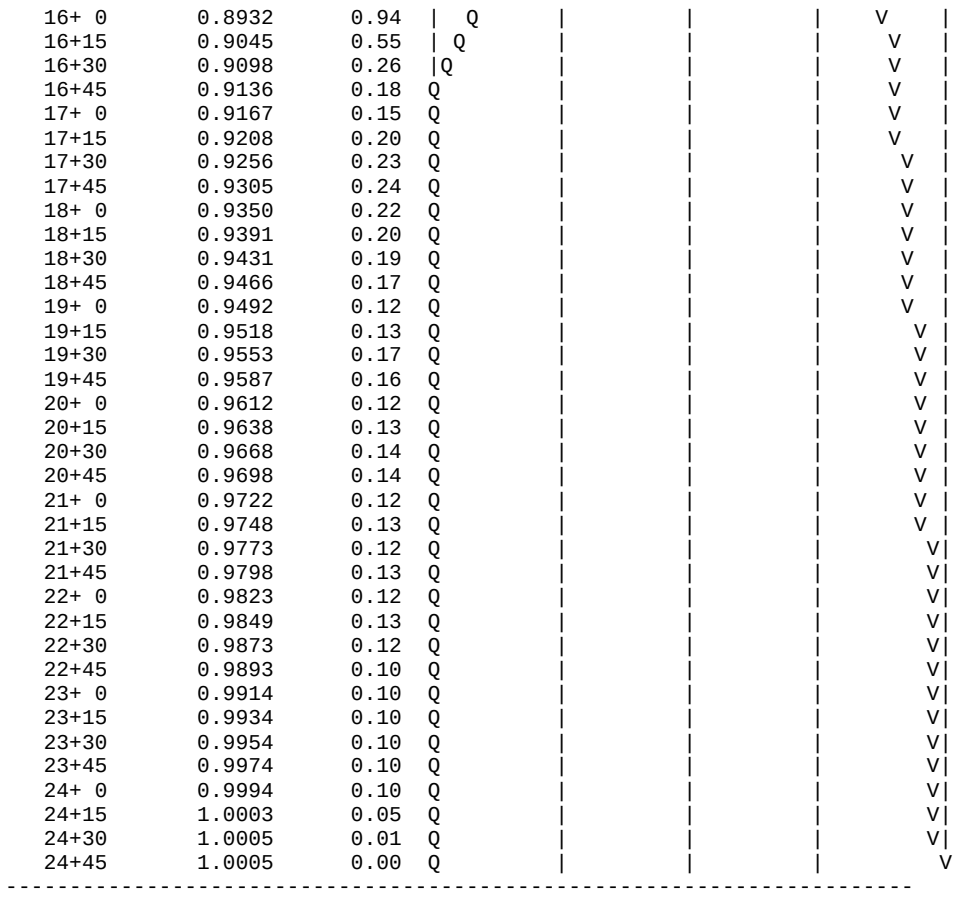
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+15	0.0010	0.05	Q
0+30	0.0034	0.11	Q
0+45	0.0062	0.14	Q
1+ 0	0.0097	0.17	Q
1+15	0.0131	0.16	Q
1+30	0.0162	0.15	Q
1+45	0.0192	0.15	Q
2+ 0	0.0228	0.17	Q
2+15	0.0267	0.19	QV
2+30	0.0306	0.19	QV
2+45	0.0352	0.22	QV
3+ 0	0.0401	0.24	QV
3+15	0.0451	0.24	QV
3+30	0.0501	0.24	Q V
3+45	0.0551	0.24	Q V
4+ 0	0.0606	0.27	QV
4+15	0.0665	0.29	QV
4+30	0.0730	0.31	QV
4+45	0.0799	0.33	Q V
5+ 0	0.0874	0.36	Q V
5+15	0.0943	0.33	Q V
5+30	0.1010	0.32	Q V
5+45	0.1084	0.36	Q V
6+ 0	0.1163	0.38	Q V
6+15	0.1248	0.41	Q V
6+30	0.1338	0.43	Q V
6+45	0.1433	0.46	Q V
7+ 0	0.1532	0.48	Q V
7+15	0.1632	0.48	Q V
7+30	0.1737	0.51	Q V
7+45	0.1851	0.55	Q V
8+ 0	0.1975	0.60	Q V
8+15	0.2115	0.67	Q V
8+30	0.2263	0.72	Q V
8+45	0.2418	0.75	Q V
9+ 0	0.2582	0.80	Q V
9+15	0.2761	0.87	Q V
9+30	0.2955	0.94	Q V
9+45	0.3159	0.99	Q V
10+ 0	0.3373	1.04	Q V
10+15	0.3556	0.89	Q V
10+30	0.3712	0.76	Q V
10+45	0.3889	0.86	Q V
11+ 0	0.4085	0.95	Q V
11+15	0.4279	0.94	Q V
11+30	0.4470	0.92	Q V
11+45	0.4650	0.87	Q V
12+ 0	0.4827	0.86	Q V
12+15	0.5042	1.04	Q V
12+30	0.5291	1.20	Q V
12+45	0.5560	1.30	Q V
13+ 0	0.5843	1.37	Q V
13+15	0.6158	1.52	Q V
13+30	0.6493	1.62	Q V
13+45	0.6776	1.37	Q V
14+ 0	0.7016	1.16	Q V
14+15	0.7268	1.22	Q V
14+30	0.7530	1.27	Q V
14+45	0.7790	1.26	Q V
15+ 0	0.8045	1.24	Q V
15+15	0.8291	1.19	Q V
15+30	0.8527	1.14	Q V
15+45	0.8738	1.02	Q V


16+ 0 0.8932 0.94
16+15 0.9045 0.55
16+30 0.9098 0.26
16+45 0.9136 0.18
17+ 0 0.9167 0.15
17+15 0.9208 0.20
17+30 0.9256 0.23
17+45 0.9305 0.24
18+ 0 0.9350 0.22
18+15 0.9391 0.20
18+30 0.9431 0.19
18+45 0.9466 0.17
19+ 0 0.9492 0.12
19+15 0.9518 0.13
19+30 0.9553 0.17
19+45 0.9587 0.16
20+ 0 0.9612 0.12
20+15 0.9638 0.13
20+30 0.9668 0.14
20+45 0.9698 0.14
21+ 0 0.9722 0.12
21+15 0.9748 0.13
21+30 0.9773 0.12
21+45 0.9798 0.13
22+ 0 0.9823 0.12
22+15 0.9849 0.13
22+30 0.9873 0.12
22+45 0.9893 0.10
23+ 0 0.9914 0.10
23+15 0.9934 0.10
23+30 0.9954 0.10
23+45 0.9974 0.10
24+ 0 0.9994 0.10
24+15 1.0003 0.05
24+30 1.0005 0.01
24+45 1.0005 0.00

- Area 'D' – 10 Year - Pre-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/12/21 File: EXD010110.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	0.55	33.02

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	1.30	78.05

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 0.859(In)
Areal adjustment factor = 99.95 %
Adjusted average point rain = 0.858(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
73.4  73.4      0.322     0.000        0.322       1.000      0.322
                                                  Sum (F) =   0.322
Area averaged mean soil loss (F) (In/Hr) =  0.322
Minimum soil loss rate ((In/Hr)) =  0.161
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5300
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083         84.723         14.638             8.857
    2   0.167        169.445         45.868            27.755
    3   0.250        254.168         18.651            11.285
    4   0.333        338.890          7.945             4.808
    5   0.417        423.613          4.722             2.857
    6   0.500        508.335          2.944             1.781
    7   0.583        593.058          2.104             1.273
    8   0.667        677.781          1.405             0.850
    9   0.750        762.503          0.925             0.560
   10   0.833        847.226          0.799             0.483
                             Sum = 100.000   Sum=      60.509
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max    |   Low        (In/Hr)
   1   0.08     3.40      0.350       (  0.322)       0.315        0.035
   2   0.17     4.70      0.484          0.322    (  0.436)        0.162
   3   0.25     4.70      0.484          0.322    (  0.436)        0.162
   4   0.33     5.10      0.525          0.322    (  0.473)        0.203
   5   0.42     5.80      0.597          0.322    (  0.538)        0.275
   6   0.50     5.90      0.608          0.322    (  0.547)        0.286
   7   0.58     7.10      0.731          0.322    (  0.658)        0.409
   8   0.67     8.70      0.896          0.322    (  0.806)        0.574
   9   0.75    13.20      1.359          0.322    (  1.223)        1.037
  10   0.83    29.70      3.058          0.322    (  2.752)        2.736
  11   0.92     7.70      0.793          0.322    (  0.714)        0.471
  12   1.00     4.00      0.412          0.322    (  0.371)        0.090
               (Loss Rate Not Used)
     Sum =     100.0                                  Sum =     6.4
       Flood volume = Effective rainfall      0.54(In)
        times area      60.0(Ac.)/[(In)/(Ft.)] =       2.7(Ac.Ft)
       Total soil loss =      0.32(In)
       Total soil loss =     1.608(Ac.Ft)
       Total rainfall =      0.86(In)
       Flood volume =      116987.5 Cubic Feet
       Total soil loss =       70028.9 Cubic Feet
       ------------------------------------------------------------------
        Peak flow rate of this hydrograph =     97.004(CFS)
       ------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))
```

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	25.0	50.0	75.0	100.0
0+ 5	0.0021	0.31	Q				
0+10	0.0187	2.41	Q				
0+15	0.0623	6.33	V Q				
0+20	0.1195	8.30	V Q				
0+25	0.1938	10.79	V Q				
0+30	0.2887	13.78	VQ				
0+35	0.4020	16.44	VQ				
0+40	0.5542	22.11	Q				
0+45	0.7790	32.64	V Q				
0+50	1.2151	63.32	V	Q			
0+55	1.8831	97.00	V	Q			
1+ 0	2.2476	52.92	Q	V			
1+ 5	2.4266	25.98	Q	V			
1+10	2.5252	14.32	Q	V			
1+15	2.5861	8.83	Q	V			
1+20	2.6273	5.98	Q	V			
1+25	2.6544	3.95	Q	V			
1+30	2.6720	2.55	Q	V			
1+35	2.6834	1.66	Q	V			
1+40	2.6854	0.28	Q	V			
1+45	2.6857	0.04	Q	V			

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/12/21 File: EXD010310.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	0.85	51.03

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	2.00	120.08

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 1.323(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.323(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
73.4	73.4	0.322	0.000	0.322	1.000	0.322
					Sum (F) =	0.322

Area averaged mean soil loss (F) (In/Hr) = 0.322
Minimum soil loss rate ((In/Hr)) = 0.161
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	84.723	14.638	8.857
2	0.167	169.445	45.868	27.755
3	0.250	254.168	18.651	11.285
4	0.333	338.890	7.945	4.808
5	0.417	423.613	4.722	2.857
6	0.500	508.335	2.944	1.781
7	0.583	593.058	2.104	1.273
8	0.667	677.781	1.405	0.850
9	0.750	762.503	0.925	0.560
10	0.833	847.226	0.799	0.483
			Sum = 100.000	Sum= 60.509

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.206	(0.322)		0.186	0.021
2	0.17	1.30	0.206	(0.322)		0.186	0.021
3	0.25	1.10	0.175	(0.322)		0.157	0.017
4	0.33	1.50	0.238	(0.322)		0.214	0.024
5	0.42	1.50	0.238	(0.322)		0.214	0.024
6	0.50	1.80	0.286	(0.322)		0.257	0.029
7	0.58	1.50	0.238	(0.322)		0.214	0.024
8	0.67	1.80	0.286	(0.322)		0.257	0.029
9	0.75	1.80	0.286	(0.322)		0.257	0.029
10	0.83	1.50	0.238	(0.322)		0.214	0.024
11	0.92	1.60	0.254	(0.322)		0.229	0.025
12	1.00	1.80	0.286	(0.322)		0.257	0.029
13	1.08	2.20	0.349	(0.322)		0.314	0.035
14	1.17	2.20	0.349	(0.322)		0.314	0.035
15	1.25	2.20	0.349	(0.322)		0.314	0.035
16	1.33	2.00	0.317	(0.322)		0.286	0.032
17	1.42	2.60	0.413	0.322	(	0.371)	0.091
18	1.50	2.70	0.429	0.322	(	0.386)	0.107
19	1.58	2.40	0.381	0.322	(	0.343)	0.059
20	1.67	2.70	0.429	0.322	(	0.386)	0.107
21	1.75	3.30	0.524	0.322	(	0.471)	0.202
22	1.83	3.10	0.492	0.322	(	0.443)	0.170
23	1.92	2.90	0.460	0.322	(	0.414)	0.138
24	2.00	3.00	0.476	0.322	(	0.429)	0.154
25	2.08	3.10	0.492	0.322	(	0.443)	0.170
26	2.17	4.20	0.667	0.322	(	0.600)	0.345
27	2.25	5.00	0.794	0.322	(	0.714)	0.472
28	2.33	3.50	0.556	0.322	(	0.500)	0.234
29	2.42	6.80	1.079	0.322	(	0.971)	0.758
30	2.50	7.30	1.159	0.322	(	1.043)	0.837
31	2.58	8.20	1.302	0.322	(	1.171)	0.980
32	2.67	5.90	0.937	0.322	(	0.843)	0.615

```
33   2.75     2.00      0.317       (  0.322)       0.286        0.032
34   2.83     1.80      0.286       (  0.322)       0.257        0.029
35   2.92     1.80      0.286       (  0.322)       0.257        0.029
36   3.00     0.60      0.095       (  0.322)       0.086        0.010
              (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     6.0
      Flood volume = Effective rainfall      0.50(In)
       times area      60.0(Ac.)/[(In)/(Ft.)] =       2.5(Ac.Ft)
      Total soil loss =      0.83(In)
      Total soil loss =     4.131(Ac.Ft)
      Total rainfall =      1.32(In)
      Flood volume =      108354.4 Cubic Feet
      Total soil loss =      179937.3 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     47.992(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
-------------------------------------------------------------------------
  0+ 5       0.0013      0.18  Q         |         |         |         |
  0+10       0.0065      0.76  Q         |         |         |         |
  0+15       0.0131      0.96  Q         |         |         |         |
  0+20       0.0202      1.03  Q         |         |         |         |
  0+25       0.0286      1.23  Q         |         |         |         |
  0+30       0.0380      1.36  VQ        |         |         |         |
  0+35       0.0483      1.50  VQ        |         |         |         |
  0+40       0.0586      1.49  VQ        |         |         |         |
  0+45       0.0698      1.61  |Q        |         |         |         |
  0+50       0.0810      1.63  |Q        |         |         |         |
  0+55       0.0916      1.54  |Q        |         |         |         |
  1+ 0       0.1024      1.57  |Q        |         |         |         |
  1+ 5       0.1142      1.72  |Q        |         |         |         |
  1+10       0.1275      1.93  |QV       |         |         |         |
  1+15       0.1413      2.01  |QV       |         |         |         |
  1+20       0.1553      2.02  |QV       |         |         |         |
  1+25       0.1723      2.48  |QV       |         |         |         |
  1+30       0.2016      4.24  |  Q      |         |         |         |
  1+35       0.2354      4.92  |  Q      |         |         |         |
  1+40       0.2663      4.48  |  QV     |         |         |         |
  1+45       0.3101      6.36  |   VQ    |         |         |         |
  1+50       0.3733      9.18  |     VQ  |         |         |         |
  1+55       0.4373      9.28  |      Q  |         |         |         |
  2+ 0       0.4976      8.76  |      QV |         |         |         |
  2+ 5       0.5608      9.17  |      Q V|         |         |         |
  2+10       0.6388     11.33  |        QV         |         |         |
  2+15       0.7597     17.55  |          | V Q    |         |         |
  2+20       0.9046     21.05  |          |   V Q  |         |         |
  2+25       1.0523     21.43  |          |     VQ |         |         |
  2+30       1.2944     35.16  |          |        V       Q |         |
  2+35       1.5979     44.07  |          |          |    V    |    Q    |
  2+40       1.9284     47.99  |          |          |         |V      Q |
  2+45       2.1769     36.08  |          |          |       Q |    V    |
  2+50       2.2975     17.50  |          |   Q      |         |     V   |
  2+55       2.3680     10.25  |        Q |          |         |       V |
  3+ 0       2.4157      6.93  |    Q     |          |         |       V |
  3+ 5       2.4461      4.41  |  Q       |          |         |        V|
  3+10       2.4656      2.83  | Q        |          |         |        V|
  3+15       2.4773      1.69  |Q         |          |         |        V|
  3+20       2.4839      0.96  Q          |          |         |        V|
  3+25       2.4866      0.39  Q          |          |         |        V|
  3+30       2.4871      0.07  Q          |          |         |        V|
  3+35       2.4873      0.04  Q          |          |         |        V|
  3+40       2.4874      0.02  Q          |          |         |        V|
  3+45       2.4875      0.00  Q          |          |         |        V|
-------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/12/21 File: EXD010610.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	1.20	72.05

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	3.00	180.12

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 1.941(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.940(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
73.4	73.4	0.322	0.000	0.322	1.000	0.322
					Sum (F) =	0.322

Area averaged mean soil loss (F) (In/Hr) = 0.322
Minimum soil loss rate ((In/Hr)) = 0.161
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

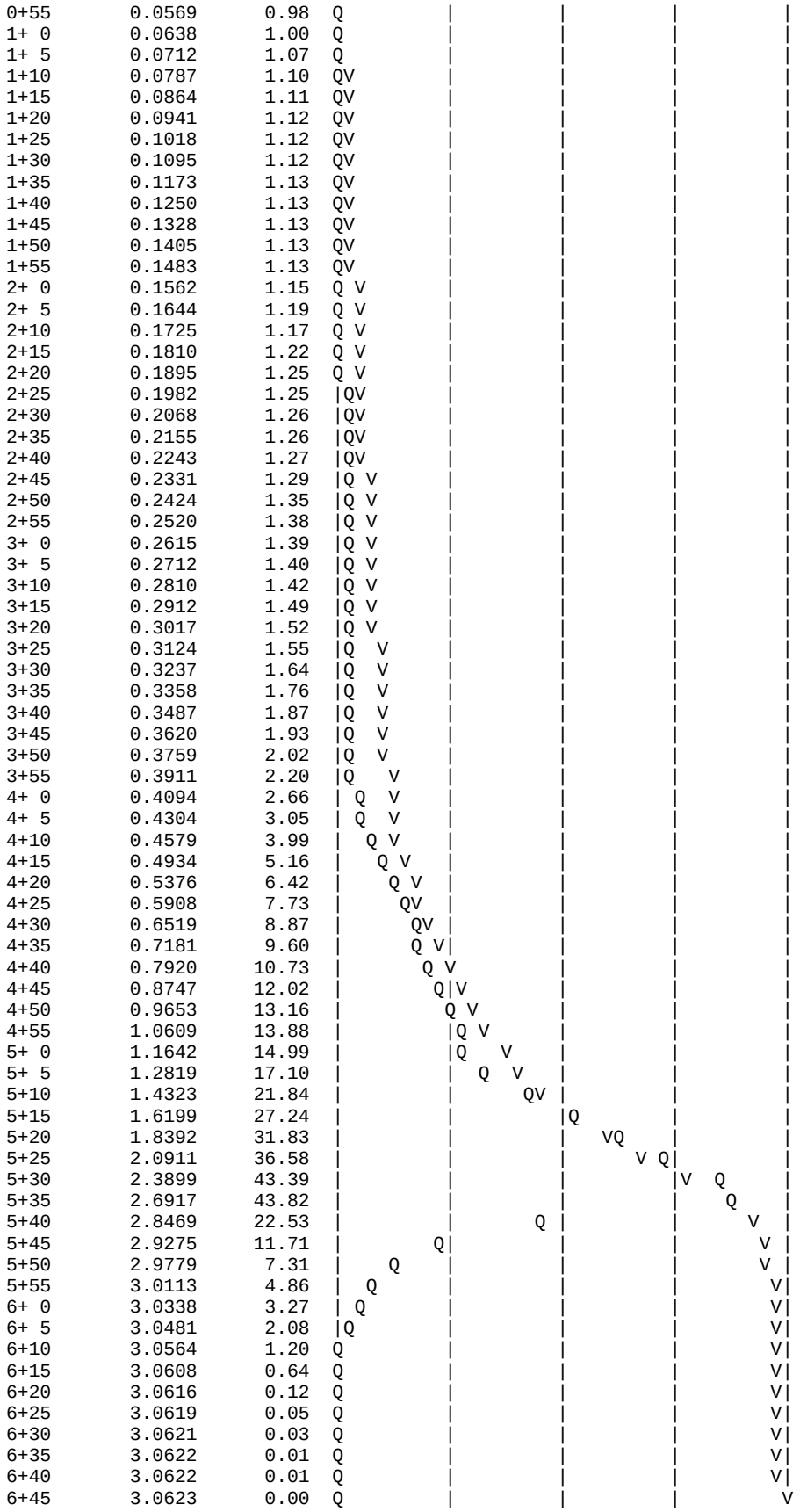
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	84.723	14.638	8.857
2	0.167	169.445	45.868	27.755
3	0.250	254.168	18.651	11.285
4	0.333	338.890	7.945	4.808
5	0.417	423.613	4.722	2.857
6	0.500	508.335	2.944	1.781
7	0.583	593.058	2.104	1.273
8	0.667	677.781	1.405	0.850
9	0.750	762.503	0.925	0.560
10	0.833	847.226	0.799	0.483
			Sum = 100.000	Sum= 60.509

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.116	(0.322)	0.105	0.012
2	0.17	0.60	0.140	(0.322)	0.126	0.014
3	0.25	0.60	0.140	(0.322)	0.126	0.014
4	0.33	0.60	0.140	(0.322)	0.126	0.014
5	0.42	0.60	0.140	(0.322)	0.126	0.014
6	0.50	0.70	0.163	(0.322)	0.147	0.016
7	0.58	0.70	0.163	(0.322)	0.147	0.016
8	0.67	0.70	0.163	(0.322)	0.147	0.016
9	0.75	0.70	0.163	(0.322)	0.147	0.016
10	0.83	0.70	0.163	(0.322)	0.147	0.016
11	0.92	0.70	0.163	(0.322)	0.147	0.016
12	1.00	0.80	0.186	(0.322)	0.168	0.019
13	1.08	0.80	0.186	(0.322)	0.168	0.019
14	1.17	0.80	0.186	(0.322)	0.168	0.019
15	1.25	0.80	0.186	(0.322)	0.168	0.019
16	1.33	0.80	0.186	(0.322)	0.168	0.019
17	1.42	0.80	0.186	(0.322)	0.168	0.019
18	1.50	0.80	0.186	(0.322)	0.168	0.019
19	1.58	0.80	0.186	(0.322)	0.168	0.019
20	1.67	0.80	0.186	(0.322)	0.168	0.019
21	1.75	0.80	0.186	(0.322)	0.168	0.019
22	1.83	0.80	0.186	(0.322)	0.168	0.019
23	1.92	0.80	0.186	(0.322)	0.168	0.019
24	2.00	0.90	0.210	(0.322)	0.189	0.021
25	2.08	0.80	0.186	(0.322)	0.168	0.019
26	2.17	0.90	0.210	(0.322)	0.189	0.021
27	2.25	0.90	0.210	(0.322)	0.189	0.021
28	2.33	0.90	0.210	(0.322)	0.189	0.021
29	2.42	0.90	0.210	(0.322)	0.189	0.021
30	2.50	0.90	0.210	(0.322)	0.189	0.021
31	2.58	0.90	0.210	(0.322)	0.189	0.021
32	2.67	0.90	0.210	(0.322)	0.189	0.021

```
33   2.75     1.00      0.233       (  0.322)       0.210        0.023
34   2.83     1.00      0.233       (  0.322)       0.210        0.023
35   2.92     1.00      0.233       (  0.322)       0.210        0.023
36   3.00     1.00      0.233       (  0.322)       0.210        0.023
37   3.08     1.00      0.233       (  0.322)       0.210        0.023
38   3.17     1.10      0.256       (  0.322)       0.230        0.026
39   3.25     1.10      0.256       (  0.322)       0.230        0.026
40   3.33     1.10      0.256       (  0.322)       0.230        0.026
41   3.42     1.20      0.279       (  0.322)       0.251        0.028
42   3.50     1.30      0.303       (  0.322)       0.272        0.030
43   3.58     1.40      0.326       (  0.322)       0.293        0.033
44   3.67     1.40      0.326       (  0.322)       0.293        0.033
45   3.75     1.50      0.349       (  0.322)       0.314        0.035
46   3.83     1.50      0.349       (  0.322)       0.314        0.035
47   3.92     1.60      0.373          0.322    (  0.335)        0.051
48   4.00     1.60      0.373          0.322    (  0.335)        0.051
49   4.08     1.70      0.396          0.322    (  0.356)        0.074
50   4.17     1.80      0.419          0.322    (  0.377)        0.097
51   4.25     1.90      0.442          0.322    (  0.398)        0.120
52   4.33     2.00      0.466          0.322    (  0.419)        0.144
53   4.42     2.10      0.489          0.322    (  0.440)        0.167
54   4.50     2.10      0.489          0.322    (  0.440)        0.167
55   4.58     2.20      0.512          0.322    (  0.461)        0.190
56   4.67     2.30      0.535          0.322    (  0.482)        0.214
57   4.75     2.40      0.559          0.322    (  0.503)        0.237
58   4.83     2.40      0.559          0.322    (  0.503)        0.237
59   4.92     2.50      0.582          0.322    (  0.524)        0.260
60   5.00     2.60      0.605          0.322    (  0.545)        0.283
61   5.08     3.10      0.722          0.322    (  0.650)        0.400
62   5.17     3.60      0.838          0.322    (  0.754)        0.516
63   5.25     3.90      0.908          0.322    (  0.817)        0.586
64   5.33     4.20      0.978          0.322    (  0.880)        0.656
65   5.42     4.70      1.094          0.322    (  0.985)        0.772
66   5.50     5.60      1.304          0.322    (  1.173)        0.982
67   5.58     1.90      0.442          0.322    (  0.398)        0.120
68   5.67     0.90      0.210       (  0.322)       0.189        0.021
69   5.75     0.60      0.140       (  0.322)       0.126        0.014
70   5.83     0.50      0.116       (  0.322)       0.105        0.012
71   5.92     0.30      0.070       (  0.322)       0.063        0.007
72   6.00     0.20      0.047       (  0.322)       0.042        0.005
             (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     7.3
      Flood volume = Effective rainfall      0.61(In)
       times area      60.0(Ac.)/[(In)/(Ft.)] =       3.1(Ac.Ft)
      Total soil loss =      1.33(In)
      Total soil loss =     6.645(Ac.Ft)
      Total rainfall =      1.94(In)
      Flood volume =      133391.9 Cubic Feet
      Total soil loss =      289451.0 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     43.816(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                      R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
-------------------------------------------------------------------------
  0+ 5       0.0007      0.10  Q         |         |         |         |
  0+10       0.0038      0.45  Q         |         |         |         |
  0+15       0.0082      0.64  Q         |         |         |         |
  0+20       0.0132      0.73  Q         |         |         |         |
  0+25       0.0185      0.77  Q         |         |         |         |
  0+30       0.0241      0.82  Q         |         |         |         |
  0+35       0.0304      0.90  Q         |         |         |         |
  0+40       0.0368      0.94  Q         |         |         |         |
  0+45       0.0435      0.96  Q         |         |         |         |
  0+50       0.0502      0.97  Q         |         |         |         |
```


0+55 0.0569 0.98
1+ 0 0.0638 1.00
1+ 5 0.0712 1.07
1+10 0.0787 1.10
1+15 0.0864 1.11
1+20 0.0941 1.12
1+25 0.1018 1.12
1+30 0.1095 1.12
1+35 0.1173 1.13
1+40 0.1250 1.13
1+45 0.1328 1.13
1+50 0.1405 1.13
1+55 0.1483 1.13
2+ 0 0.1562 1.15
2+ 5 0.1644 1.19
2+10 0.1725 1.17
2+15 0.1810 1.22
2+20 0.1895 1.25
2+25 0.1982 1.25
2+30 0.2068 1.26
2+35 0.2155 1.26
2+40 0.2243 1.27
2+45 0.2331 1.29
2+50 0.2424 1.35
2+55 0.2520 1.38
3+ 0 0.2615 1.39
3+ 5 0.2712 1.40
3+10 0.2810 1.42
3+15 0.2912 1.49
3+20 0.3017 1.52
3+25 0.3124 1.55
3+30 0.3237 1.64
3+35 0.3358 1.76
3+40 0.3487 1.87
3+45 0.3620 1.93
3+50 0.3759 2.02
3+55 0.3911 2.20
4+ 0 0.4094 2.66
4+ 5 0.4304 3.05
4+10 0.4579 3.99
4+15 0.4934 5.16
4+20 0.5376 6.42
4+25 0.5908 7.73
4+30 0.6519 8.87
4+35 0.7181 9.60
4+40 0.7920 10.73
4+45 0.8747 12.02
4+50 0.9653 13.16
4+55 1.0609 13.88
5+ 0 1.1642 14.99
5+ 5 1.2819 17.10
5+10 1.4323 21.84
5+15 1.6199 27.24
5+20 1.8392 31.83
5+25 2.0911 36.58
5+30 2.3899 43.39
5+35 2.6917 43.82
5+40 2.8469 22.53
5+45 2.9275 11.71
5+50 2.9779 7.31
5+55 3.0113 4.86
6+ 0 3.0338 3.27
6+ 5 3.0481 2.08
6+10 3.0564 1.20
6+15 3.0608 0.64
6+20 3.0616 0.12
6+25 3.0619 0.05
6+30 3.0621 0.03
6+35 3.0622 0.01
6+40 3.0622 0.01
6+45 3.0623 0.00

U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: EXD0102410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'D'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 10 YEAR HOUR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	2.00	120.08

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	5.00	300.20

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 3.234(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 3.234(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
73.4	73.4	0.322	0.000	0.322	1.000	0.322
					Sum (F) =	0.322

Area averaged mean soil loss (F) (In/Hr) = 0.322
Minimum soil loss rate ((In/Hr)) = 0.161
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	254.168	51.434	31.122
2	0.500	508.335	39.798	24.081
3	0.750	762.503	6.885	4.166
4	1.000	1016.671	1.884	1.140
			Sum = 100.000	Sum= 60.509

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.026	(0.568)	0.023	0.003
2	0.50	0.30	0.039	(0.562)	0.035	0.004
3	0.75	0.30	0.039	(0.555)	0.035	0.004
4	1.00	0.40	0.052	(0.549)	0.047	0.005
5	1.25	0.30	0.039	(0.542)	0.035	0.004
6	1.50	0.30	0.039	(0.536)	0.035	0.004
7	1.75	0.30	0.039	(0.529)	0.035	0.004
8	2.00	0.40	0.052	(0.523)	0.047	0.005
9	2.25	0.40	0.052	(0.517)	0.047	0.005
10	2.50	0.40	0.052	(0.510)	0.047	0.005
11	2.75	0.50	0.065	(0.504)	0.058	0.006
12	3.00	0.50	0.065	(0.498)	0.058	0.006
13	3.25	0.50	0.065	(0.492)	0.058	0.006
14	3.50	0.50	0.065	(0.486)	0.058	0.006
15	3.75	0.50	0.065	(0.480)	0.058	0.006
16	4.00	0.60	0.078	(0.474)	0.070	0.008
17	4.25	0.60	0.078	(0.468)	0.070	0.008
18	4.50	0.70	0.091	(0.462)	0.081	0.009
19	4.75	0.70	0.091	(0.456)	0.081	0.009
20	5.00	0.80	0.103	(0.450)	0.093	0.010
21	5.25	0.60	0.078	(0.444)	0.070	0.008
22	5.50	0.70	0.091	(0.438)	0.081	0.009
23	5.75	0.80	0.103	(0.432)	0.093	0.010
24	6.00	0.80	0.103	(0.427)	0.093	0.010
25	6.25	0.90	0.116	(0.421)	0.105	0.012
26	6.50	0.90	0.116	(0.415)	0.105	0.012
27	6.75	1.00	0.129	(0.410)	0.116	0.013
28	7.00	1.00	0.129	(0.404)	0.116	0.013
29	7.25	1.00	0.129	(0.399)	0.116	0.013
30	7.50	1.10	0.142	(0.393)	0.128	0.014
31	7.75	1.20	0.155	(0.388)	0.140	0.016
32	8.00	1.30	0.168	(0.383)	0.151	0.017
33	8.25	1.50	0.194	(0.377)	0.175	0.019
34	8.50	1.50	0.194	(0.372)	0.175	0.019
35	8.75	1.60	0.207	(0.367)	0.186	0.021
36	9.00	1.70	0.220	(0.362)	0.198	0.022
37	9.25	1.90	0.246	(0.357)	0.221	0.025
38	9.50	2.00	0.259	(0.352)	0.233	0.026

39	9.75	2.10	0.272	(0.347)	0.244	0.027
40	10.00	2.20	0.285	(0.342)	0.256	0.028
41	10.25	1.50	0.194	(0.337)	0.175	0.019
42	10.50	1.50	0.194	(0.332)	0.175	0.019
43	10.75	2.00	0.259	(0.327)	0.233	0.026
44	11.00	2.00	0.259	(0.322)	0.233	0.026
45	11.25	1.90	0.246	(0.317)	0.221	0.025
46	11.50	1.90	0.246	(0.313)	0.221	0.025
47	11.75	1.70	0.220	(0.308)	0.198	0.022
48	12.00	1.80	0.233	(0.303)	0.210	0.023
49	12.25	2.50	0.323	(0.299)	0.291	0.032
50	12.50	2.60	0.336	0.294	(0.303)	0.042
51	12.75	2.80	0.362	0.290	(0.326)	0.072
52	13.00	2.90	0.375	0.286	(0.338)	0.089
53	13.25	3.40	0.440	0.281	(0.396)	0.158
54	13.50	3.40	0.440	0.277	(0.396)	0.163
55	13.75	2.30	0.298	(0.273)	0.268	0.030
56	14.00	2.30	0.298	(0.269)	0.268	0.030
57	14.25	2.70	0.349	0.265	(0.314)	0.085
58	14.50	2.60	0.336	0.261	(0.303)	0.076
59	14.75	2.60	0.336	0.257	(0.303)	0.080
60	15.00	2.50	0.323	0.253	(0.291)	0.071
61	15.25	2.40	0.310	0.249	(0.279)	0.062
62	15.50	2.30	0.298	0.245	(0.268)	0.052
63	15.75	1.90	0.246	(0.241)	0.221	0.025
64	16.00	1.90	0.246	(0.238)	0.221	0.025
65	16.25	0.40	0.052	(0.234)	0.047	0.005
66	16.50	0.40	0.052	(0.230)	0.047	0.005
67	16.75	0.30	0.039	(0.227)	0.035	0.004
68	17.00	0.30	0.039	(0.223)	0.035	0.004
69	17.25	0.50	0.065	(0.220)	0.058	0.006
70	17.50	0.50	0.065	(0.217)	0.058	0.006
71	17.75	0.50	0.065	(0.214)	0.058	0.006
72	18.00	0.40	0.052	(0.210)	0.047	0.005
73	18.25	0.40	0.052	(0.207)	0.047	0.005
74	18.50	0.40	0.052	(0.204)	0.047	0.005
75	18.75	0.30	0.039	(0.201)	0.035	0.004
76	19.00	0.20	0.026	(0.198)	0.023	0.003
77	19.25	0.30	0.039	(0.196)	0.035	0.004
78	19.50	0.40	0.052	(0.193)	0.047	0.005
79	19.75	0.30	0.039	(0.190)	0.035	0.004
80	20.00	0.20	0.026	(0.188)	0.023	0.003
81	20.25	0.30	0.039	(0.185)	0.035	0.004
82	20.50	0.30	0.039	(0.183)	0.035	0.004
83	20.75	0.30	0.039	(0.181)	0.035	0.004
84	21.00	0.20	0.026	(0.178)	0.023	0.003
85	21.25	0.30	0.039	(0.176)	0.035	0.004
86	21.50	0.20	0.026	(0.174)	0.023	0.003
87	21.75	0.30	0.039	(0.172)	0.035	0.004
88	22.00	0.20	0.026	(0.171)	0.023	0.003
89	22.25	0.30	0.039	(0.169)	0.035	0.004
90	22.50	0.20	0.026	(0.167)	0.023	0.003
91	22.75	0.20	0.026	(0.166)	0.023	0.003
92	23.00	0.20	0.026	(0.165)	0.023	0.003
93	23.25	0.20	0.026	(0.163)	0.023	0.003
94	23.50	0.20	0.026	(0.162)	0.023	0.003
95	23.75	0.20	0.026	(0.162)	0.023	0.003
96	24.00	0.20	0.026	(0.161)	0.023	0.003

(Loss Rate Not Used)

Sum = 100.0 Sum = 1.9

Flood volume = Effective rainfall 0.46(In)
times area 60.0(Ac.)/[(In)/(Ft.)] = 2.3(Ac.Ft)
Total soil loss = 2.77(In)
Total soil loss = 13.863(Ac.Ft)
Total rainfall = 3.23(In)
Flood volume = 100922.1 Cubic Feet
Total soil loss = 603878.9 Cubic Feet

Peak flow rate of this hydrograph = 9.338(CFS)

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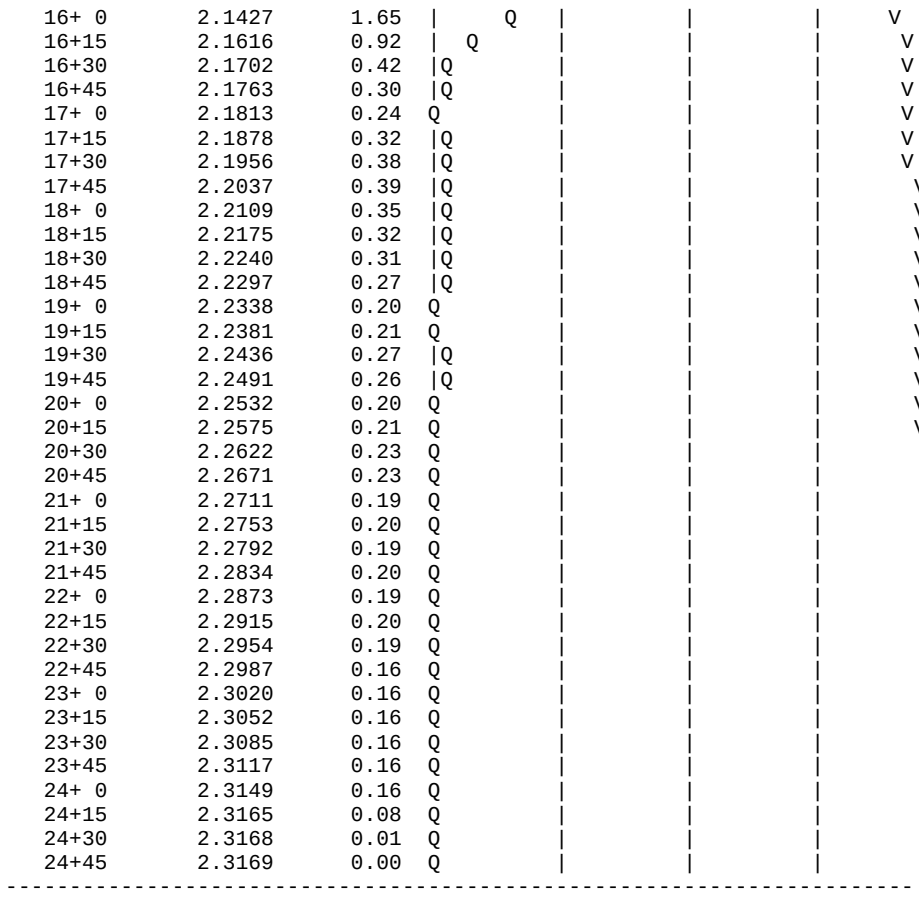
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+15	0.0017	0.08	Q
0+30	0.0054	0.18	Q
0+45	0.0101	0.23	Q
1+ 0	0.0158	0.27	VQ
1+15	0.0213	0.27	VQ
1+30	0.0262	0.24	Q
1+45	0.0311	0.24	Q
2+ 0	0.0368	0.28	VQ
2+15	0.0431	0.31	VQ
2+30	0.0496	0.31	VQ
2+45	0.0569	0.35	VQ
3+ 0	0.0648	0.38	|Q
3+15	0.0729	0.39	|Q
3+30	0.0810	0.39	|Q
3+45	0.0891	0.39	|Q
4+ 0	0.0980	0.43	|Q
4+15	0.1075	0.46	|Q
4+30	0.1181	0.51	| Q
4+45	0.1292	0.54	| Q
5+ 0	0.1414	0.59	| Q
5+15	0.1525	0.54	| Q
5+30	0.1633	0.52	| Q
5+45	0.1754	0.58	| QV
6+ 0	0.1881	0.62	| QV
6+15	0.2019	0.67	| QV
6+30	0.2163	0.70	| QV
6+45	0.2317	0.74	| QV
7+ 0	0.2477	0.78	| QV
7+15	0.2639	0.78	| QV
7+30	0.2809	0.82	| QV
7+45	0.2994	0.89	| Q V
8+ 0	0.3194	0.97	| Q V
8+15	0.3420	1.09	| QV
8+30	0.3659	1.16	| Q V
8+45	0.3910	1.21	| Q V
9+ 0	0.4175	1.29	| Q V
9+15	0.4465	1.40	| Q V
9+30	0.4778	1.51	| Q V
9+45	0.5108	1.60	| Q V
10+ 0	0.5454	1.68	| Q V
10+15	0.5750	1.43	| Q V
10+30	0.6003	1.22	| Q V
10+45	0.6289	1.39	| Q V
11+ 0	0.6605	1.53	| Q |V
11+15	0.6919	1.52	| Q |V
11+30	0.7228	1.49	| Q | V
11+45	0.7519	1.41	| Q | V
12+ 0	0.7805	1.39	| Q | V
12+15	0.8154	1.69	| Q | V
12+30	0.8609	2.20	| Q | V
12+45	0.9315	3.42	| | Q V
13+ 0	1.0293	4.73	| | VQ
13+15	1.1830	7.44	| | V Q
13+30	1.3759	9.34	| | V Q
13+45	1.4918	5.61	| | Q V
14+ 0	1.5435	2.50	| Q | V
14+15	1.6191	3.66	| | Q | V
14+30	1.7132	4.55	| | Q | V
14+45	1.8102	4.69	| | Q | V
15+ 0	1.9038	4.53	| | Q | V
15+15	1.9873	4.04	| | Q | V
15+30	2.0597	3.50	| | Q | V
15+45	2.1086	2.37	| Q| | | V


16+ 0 2.1427 1.65
16+15 2.1616 0.92
16+30 2.1702 0.42
16+45 2.1763 0.30
17+ 0 2.1813 0.24
17+15 2.1878 0.32
17+30 2.1956 0.38
17+45 2.2037 0.39
18+ 0 2.2109 0.35
18+15 2.2175 0.32
18+30 2.2240 0.31
18+45 2.2297 0.27
19+ 0 2.2338 0.20
19+15 2.2381 0.21
19+30 2.2436 0.27
19+45 2.2491 0.26
20+ 0 2.2532 0.20
20+15 2.2575 0.21
20+30 2.2622 0.23
20+45 2.2671 0.23
21+ 0 2.2711 0.19
21+15 2.2753 0.20
21+30 2.2792 0.19
21+45 2.2834 0.20
22+ 0 2.2873 0.19
22+15 2.2915 0.20
22+30 2.2954 0.19
22+45 2.2987 0.16
23+ 0 2.3020 0.16
23+15 2.3052 0.16
23+30 2.3085 0.16
23+45 2.3117 0.16
24+ 0 2.3149 0.16
24+15 2.3165 0.08
24+30 2.3168 0.01
24+45 2.3169 0.00

- Area 'D' – 100 Year - Pre-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/12/21 File: EXD1001100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	0.55	33.02

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	1.30	78.05

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 1.300(In)
Areal adjustment factor = 99.95 %
Adjusted average point rain = 1.299(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
73.4  87.0      0.164     0.000        0.164       1.000      0.164
                                                  Sum (F) =   0.164
Area averaged mean soil loss (F) (In/Hr) =  0.164
Minimum soil loss rate ((In/Hr)) =  0.082
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5300
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083         84.723         14.638             8.857
    2   0.167        169.445         45.868            27.755
    3   0.250        254.168         18.651            11.285
    4   0.333        338.890          7.945             4.808
    5   0.417        423.613          4.722             2.857
    6   0.500        508.335          2.944             1.781
    7   0.583        593.058          2.104             1.273
    8   0.667        677.781          1.405             0.850
    9   0.750        762.503          0.925             0.560
   10   0.833        847.226          0.799             0.483
                             Sum = 100.000   Sum=      60.509
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max    |   Low        (In/Hr)
   1   0.08     3.40      0.530          0.164    (  0.477)        0.366
   2   0.17     4.70      0.733          0.164    (  0.660)        0.569
   3   0.25     4.70      0.733          0.164    (  0.660)        0.569
   4   0.33     5.10      0.795          0.164    (  0.716)        0.631
   5   0.42     5.80      0.904          0.164    (  0.814)        0.741
   6   0.50     5.90      0.920          0.164    (  0.828)        0.756
   7   0.58     7.10      1.107          0.164    (  0.996)        0.943
   8   0.67     8.70      1.356          0.164    (  1.221)        1.193
   9   0.75    13.20      2.058          0.164    (  1.852)        1.894
  10   0.83    29.70      4.631          0.164    (  4.168)        4.467
  11   0.92     7.70      1.201          0.164    (  1.080)        1.037
  12   1.00     4.00      0.624          0.164    (  0.561)        0.460
               (Loss Rate Not Used)
     Sum =     100.0                                 Sum =    13.6
       Flood volume = Effective rainfall      1.14(In)
        times area      60.0(Ac.)/[(In)/(Ft.)] =       5.7(Ac.Ft)
       Total soil loss =      0.16(In)
       Total soil loss =     0.819(Ac.Ft)
       Total rainfall =      1.30(In)
       Flood volume =      247487.4 Cubic Feet
       Total soil loss =       35687.2 Cubic Feet
       ------------------------------------------------------------------
        Peak flow rate of this hydrograph =    166.474(CFS)
       ------------------------------------------------------------------
       ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
       ------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))
```

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	50.0	100.0	150.0	200.0
0+ 5	0.0224	3.25	Q				
0+10	0.1272	15.22	V Q				
0+15	0.2992	24.98	V Q				
0+20	0.5030	29.59	V Q				
0+25	0.7392	34.31	VQ				
0+30	1.0107	39.41	Q				
0+35	1.3127	43.86	QV				
0+40	1.6758	52.72	QV				
0+45	2.1500	68.85	Q V				
0+50	2.9452	115.46			V Q		
0+55	4.0917	166.47				V Q	
1+ 0	4.7785	99.73			Q	V	
1+ 5	5.1647	56.07	Q			V	
1+10	5.3673	29.43	Q			V	
1+15	5.4876	17.46	Q			V	
1+20	5.5674	11.59	Q			V	
1+25	5.6196	7.58	Q			V	
1+30	5.6532	4.88	Q			V	
1+35	5.6748	3.13	Q			V	
1+40	5.6800	0.76	Q			V	
1+45	5.6815	0.22	Q			V	

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/12/21 File: EXD1003100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	0.85	51.03

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	2.00	120.08

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 99.97 %
Adjusted average point rain = 1.999(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
73.4	87.0	0.164	0.000	0.164	1.000	0.164
					Sum (F) =	0.164

Area averaged mean soil loss (F) (In/Hr) = 0.164
Minimum soil loss rate ((In/Hr)) = 0.082
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	84.723	14.638	8.857
2	0.167	169.445	45.868	27.755
3	0.250	254.168	18.651	11.285
4	0.333	338.890	7.945	4.808
5	0.417	423.613	4.722	2.857
6	0.500	508.335	2.944	1.781
7	0.583	593.058	2.104	1.273
8	0.667	677.781	1.405	0.850
9	0.750	762.503	0.925	0.560
10	0.833	847.226	0.799	0.483
			Sum = 100.000	Sum= 60.509

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.312	0.164	(0.281)	0.148
2	0.17	1.30	0.312	0.164	(0.281)	0.148
3	0.25	1.10	0.264	0.164	(0.238)	0.100
4	0.33	1.50	0.360	0.164	(0.324)	0.196
5	0.42	1.50	0.360	0.164	(0.324)	0.196
6	0.50	1.80	0.432	0.164	(0.389)	0.268
7	0.58	1.50	0.360	0.164	(0.324)	0.196
8	0.67	1.80	0.432	0.164	(0.389)	0.268
9	0.75	1.80	0.432	0.164	(0.389)	0.268
10	0.83	1.50	0.360	0.164	(0.324)	0.196
11	0.92	1.60	0.384	0.164	(0.346)	0.220
12	1.00	1.80	0.432	0.164	(0.389)	0.268
13	1.08	2.20	0.528	0.164	(0.475)	0.364
14	1.17	2.20	0.528	0.164	(0.475)	0.364
15	1.25	2.20	0.528	0.164	(0.475)	0.364
16	1.33	2.00	0.480	0.164	(0.432)	0.316
17	1.42	2.60	0.624	0.164	(0.561)	0.460
18	1.50	2.70	0.648	0.164	(0.583)	0.484
19	1.58	2.40	0.576	0.164	(0.518)	0.412
20	1.67	2.70	0.648	0.164	(0.583)	0.484
21	1.75	3.30	0.792	0.164	(0.713)	0.628
22	1.83	3.10	0.744	0.164	(0.669)	0.580
23	1.92	2.90	0.696	0.164	(0.626)	0.532
24	2.00	3.00	0.720	0.164	(0.648)	0.556
25	2.08	3.10	0.744	0.164	(0.669)	0.580
26	2.17	4.20	1.008	0.164	(0.907)	0.844
27	2.25	5.00	1.200	0.164	(1.080)	1.036
28	2.33	3.50	0.840	0.164	(0.756)	0.676
29	2.42	6.80	1.632	0.164	(1.468)	1.468
30	2.50	7.30	1.752	0.164	(1.576)	1.588
31	2.58	8.20	1.967	0.164	(1.771)	1.804
32	2.67	5.90	1.416	0.164	(1.274)	1.252

```
33   2.75     2.00      0.480          0.164    (  0.432)        0.316
34   2.83     1.80      0.432          0.164    (  0.389)        0.268
35   2.92     1.80      0.432          0.164    (  0.389)        0.268
36   3.00     0.60      0.144       (  0.164)       0.130        0.014
              (Loss Rate Not Used)
   Sum =     100.0                                  Sum =    18.1
      Flood volume = Effective rainfall      1.51(In)
       times area      60.0(Ac.)/[(In)/(Ft.)] =       7.6(Ac.Ft)
      Total soil loss =      0.49(In)
      Total soil loss =     2.444(Ac.Ft)
      Total rainfall =      2.00(In)
      Flood volume =      329335.0 Cubic Feet
      Total soil loss =      106440.9 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     92.086(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           3 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       25.0      50.0      75.0     100.0
---------------------------------------------------------------------------
  0+ 5       0.0090      1.31  Q         |         |         |         |
  0+10       0.0464      5.43  V Q       |         |         |         |
  0+15       0.0924      6.68  V Q       |         |         |         |
  0+20       0.1400      6.91  V Q       |         |         |         |
  0+25       0.2051      9.45  |V Q       |         |         |         |
  0+30       0.2823     11.21  |V  Q      |         |         |         |
  0+35       0.3724     13.08  |V   Q     |         |         |         |
  0+40       0.4608     12.85  | V  Q     |         |         |         |
  0+45       0.5612     14.57  | V  Q     |         |         |         |
  0+50       0.6629     14.76  |  V Q     |         |         |         |
  0+55       0.7545     13.30  |  V Q     |         |         |         |
  1+ 0       0.8493     13.78  |   VQ     |         |         |         |
  1+ 5       0.9597     16.03  |    VQ    |         |         |         |
  1+10       1.0921     19.22  |    V Q   |         |         |         |
  1+15       1.2335     20.53  |     V Q  |         |         |         |
  1+20       1.3757     20.66  |      VQ  |         |         |         |
  1+25       1.5201     20.96  |       Q  |         |         |         |
  1+30       1.6912     24.85  |       VQ |         |         |         |
  1+35       1.8731     26.41  |        VQ|         |         |         |
  1+40       2.0521     26.00  |         Q|         |         |         |
  1+45       2.2517     28.98  |          |Q        |         |         |
  1+50       2.4812     33.32  |          |  Q      |         |         |
  1+55       2.7120     33.52  |          |  QV     |         |         |
  2+ 0       2.9376     32.75  |          |  Q V    |         |         |
  2+ 5       3.1675     33.38  |          |  Q  V   |         |         |
  2+10       3.4200     36.66  |          |   Q   V |         |         |
  2+15       3.7373     46.07  |          |       QV|         |         |
  2+20       4.0910     51.36  |          |         QV        |         |
  2+25       4.4488     51.94  |          |         Q  V      |         |
  2+30       4.9493     72.68  |          |          |     V  Q|         |
  2+35       5.5427     86.16  |          |          |        V|   Q     |
  2+40       6.1769     92.09  |          |          |         | V   Q   |
  2+45       6.6838     73.60  |          |          |        Q|    V    |
  2+50       6.9842     43.62  |          |       Q  |         |     V   |
  2+55       7.1965     30.83  |          | Q        |         |       V |
  3+ 0       7.3554     23.07  |         Q|          |         |       V |
  3+ 5       7.4425     12.65  |    Q     |          |         |        V|
  3+10       7.4942      7.51  |  Q       |          |         |        V|
  3+15       7.5256      4.56  |Q         |          |         |        V|
  3+20       7.5442      2.70  |Q         |          |         |        V|
  3+25       7.5537      1.38  Q          |          |         |        V|
  3+30       7.5575      0.55  Q          |          |         |        V|
  3+35       7.5595      0.29  Q          |          |         |        V|
  3+40       7.5604      0.14  Q          |          |         |        V|
  3+45       7.5605      0.01  Q          |          |         |         V
---------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/12/21 File: EXD1006100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	1.20	72.05

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	3.00	180.12

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 2.999(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
73.4	87.0	0.164	0.000	0.164	1.000	0.164
					Sum (F) =	0.164

Area averaged mean soil loss (F) (In/Hr) = 0.164
Minimum soil loss rate ((In/Hr)) = 0.082
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

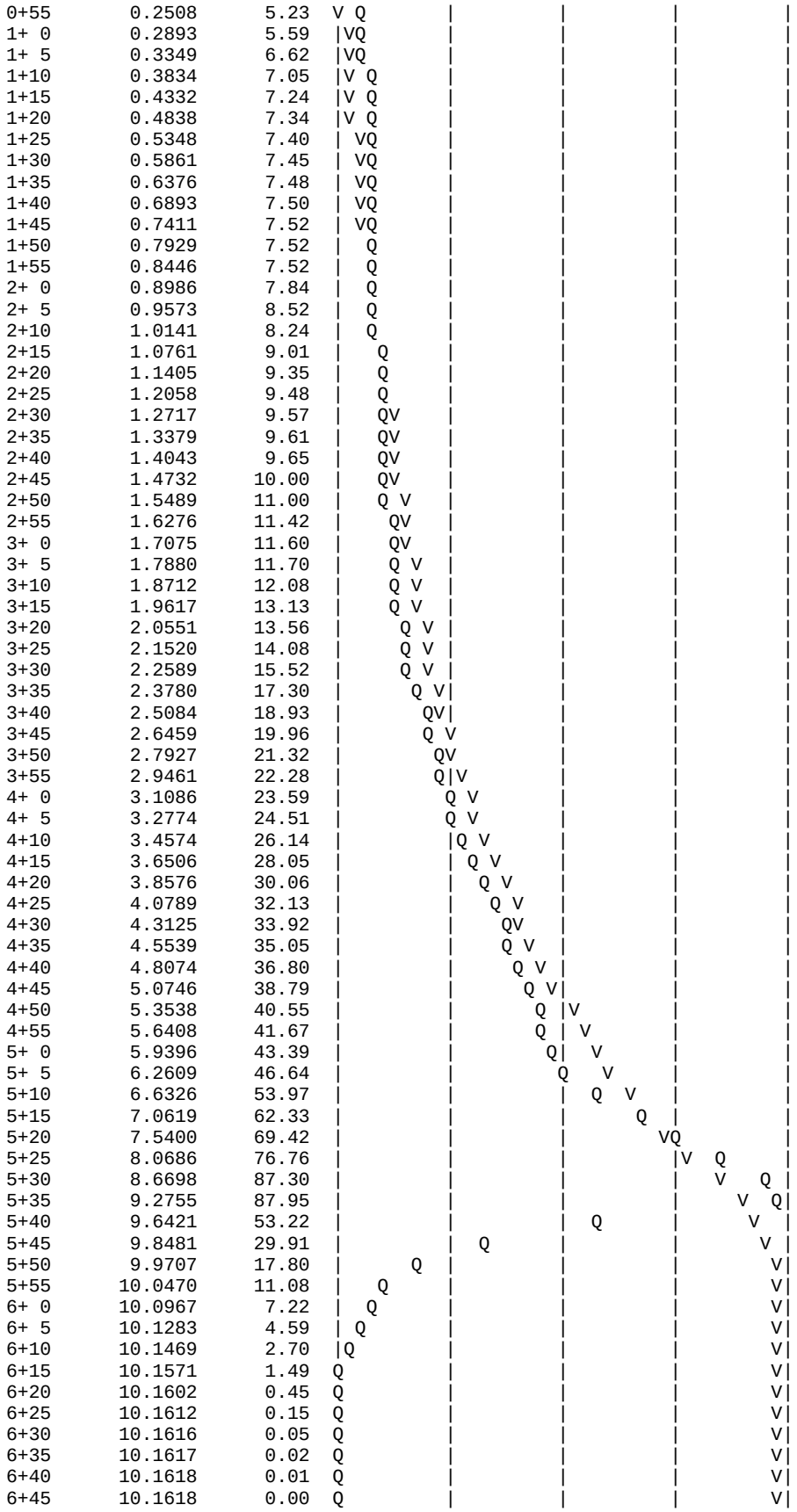
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	84.723	14.638	8.857
2	0.167	169.445	45.868	27.755
3	0.250	254.168	18.651	11.285
4	0.333	338.890	7.945	4.808
5	0.417	423.613	4.722	2.857
6	0.500	508.335	2.944	1.781
7	0.583	593.058	2.104	1.273
8	0.667	677.781	1.405	0.850
9	0.750	762.503	0.925	0.560
10	0.833	847.226	0.799	0.483
			Sum = 100.000	Sum= 60.509

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.164)	0.162	0.018
2	0.17	0.60	0.216	0.164	(0.194)	0.052
3	0.25	0.60	0.216	0.164	(0.194)	0.052
4	0.33	0.60	0.216	0.164	(0.194)	0.052
5	0.42	0.60	0.216	0.164	(0.194)	0.052
6	0.50	0.70	0.252	0.164	(0.227)	0.088
7	0.58	0.70	0.252	0.164	(0.227)	0.088
8	0.67	0.70	0.252	0.164	(0.227)	0.088
9	0.75	0.70	0.252	0.164	(0.227)	0.088
10	0.83	0.70	0.252	0.164	(0.227)	0.088
11	0.92	0.70	0.252	0.164	(0.227)	0.088
12	1.00	0.80	0.288	0.164	(0.259)	0.124
13	1.08	0.80	0.288	0.164	(0.259)	0.124
14	1.17	0.80	0.288	0.164	(0.259)	0.124
15	1.25	0.80	0.288	0.164	(0.259)	0.124
16	1.33	0.80	0.288	0.164	(0.259)	0.124
17	1.42	0.80	0.288	0.164	(0.259)	0.124
18	1.50	0.80	0.288	0.164	(0.259)	0.124
19	1.58	0.80	0.288	0.164	(0.259)	0.124
20	1.67	0.80	0.288	0.164	(0.259)	0.124
21	1.75	0.80	0.288	0.164	(0.259)	0.124
22	1.83	0.80	0.288	0.164	(0.259)	0.124
23	1.92	0.80	0.288	0.164	(0.259)	0.124
24	2.00	0.90	0.324	0.164	(0.292)	0.160
25	2.08	0.80	0.288	0.164	(0.259)	0.124
26	2.17	0.90	0.324	0.164	(0.292)	0.160
27	2.25	0.90	0.324	0.164	(0.292)	0.160
28	2.33	0.90	0.324	0.164	(0.292)	0.160
29	2.42	0.90	0.324	0.164	(0.292)	0.160
30	2.50	0.90	0.324	0.164	(0.292)	0.160
31	2.58	0.90	0.324	0.164	(0.292)	0.160
32	2.67	0.90	0.324	0.164	(0.292)	0.160

```
33   2.75     1.00      0.360          0.164    (  0.324)        0.196
34   2.83     1.00      0.360          0.164    (  0.324)        0.196
35   2.92     1.00      0.360          0.164    (  0.324)        0.196
36   3.00     1.00      0.360          0.164    (  0.324)        0.196
37   3.08     1.00      0.360          0.164    (  0.324)        0.196
38   3.17     1.10      0.396          0.164    (  0.356)        0.232
39   3.25     1.10      0.396          0.164    (  0.356)        0.232
40   3.33     1.10      0.396          0.164    (  0.356)        0.232
41   3.42     1.20      0.432          0.164    (  0.389)        0.268
42   3.50     1.30      0.468          0.164    (  0.421)        0.304
43   3.58     1.40      0.504          0.164    (  0.454)        0.340
44   3.67     1.40      0.504          0.164    (  0.454)        0.340
45   3.75     1.50      0.540          0.164    (  0.486)        0.376
46   3.83     1.50      0.540          0.164    (  0.486)        0.376
47   3.92     1.60      0.576          0.164    (  0.518)        0.412
48   4.00     1.60      0.576          0.164    (  0.518)        0.412
49   4.08     1.70      0.612          0.164    (  0.551)        0.448
50   4.17     1.80      0.648          0.164    (  0.583)        0.484
51   4.25     1.90      0.684          0.164    (  0.615)        0.520
52   4.33     2.00      0.720          0.164    (  0.648)        0.556
53   4.42     2.10      0.756          0.164    (  0.680)        0.592
54   4.50     2.10      0.756          0.164    (  0.680)        0.592
55   4.58     2.20      0.792          0.164    (  0.713)        0.628
56   4.67     2.30      0.828          0.164    (  0.745)        0.664
57   4.75     2.40      0.864          0.164    (  0.777)        0.700
58   4.83     2.40      0.864          0.164    (  0.777)        0.700
59   4.92     2.50      0.900          0.164    (  0.810)        0.736
60   5.00     2.60      0.936          0.164    (  0.842)        0.772
61   5.08     3.10      1.116          0.164    (  1.004)        0.952
62   5.17     3.60      1.296          0.164    (  1.166)        1.132
63   5.25     3.90      1.404          0.164    (  1.263)        1.240
64   5.33     4.20      1.512          0.164    (  1.361)        1.348
65   5.42     4.70      1.692          0.164    (  1.522)        1.528
66   5.50     5.60      2.016          0.164    (  1.814)        1.852
67   5.58     1.90      0.684          0.164    (  0.615)        0.520
68   5.67     0.90      0.324          0.164    (  0.292)        0.160
69   5.75     0.60      0.216          0.164    (  0.194)        0.052
70   5.83     0.50      0.180       (  0.164)       0.162        0.018
71   5.92     0.30      0.108       (  0.164)       0.097        0.011
72   6.00     0.20      0.072       (  0.164)       0.065        0.007
              (Loss Rate Not Used)
   Sum =     100.0                                   Sum =    24.4
      Flood volume = Effective rainfall      2.03(In)
       times area      60.0(Ac.)/[(In)/(Ft.)] =      10.2(Ac.Ft)
      Total soil loss =      0.97(In)
      Total soil loss =     4.845(Ac.Ft)
      Total rainfall =      3.00(In)
      Flood volume =      442648.1 Cubic Feet
      Total soil loss =      211052.5 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     87.950(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                           6 - H O U R    S T O R M
                        R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                   Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       22.5      45.0      67.5      90.0
-------------------------------------------------------------------------
  0+ 5       0.0011      0.16  Q         |         |         |         |
  0+10       0.0077      0.96  Q         |         |         |         |
  0+15       0.0223      2.12  Q         |         |         |         |
  0+20       0.0401      2.59  VQ        |         |         |         |
  0+25       0.0594      2.80  VQ        |         |         |         |
  0+30       0.0818      3.25  VQ        |         |         |         |
  0+35       0.1117      4.34  VQ        |         |         |         |
  0+40       0.1448      4.80  V Q       |         |         |         |
  0+45       0.1793      5.01  V Q       |         |         |         |
  0+50       0.2148      5.15  V Q       |         |         |         |
```



U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: EXD10024100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - GOLDEN MEADOWS HYDROLOGY STUDY – AREA 'D'
EXISTING CONDITION 'OVERALL' UNIT HYDROGRAPH - 100 YEAR HOUR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE

Drainage Area = 60.04(Ac.) = 0.094 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 60.04(Ac.) = 0.094 Sq. Mi.
Length along longest watercourse = 2506.00(Ft.)
Length along longest watercourse measured to centroid = 1300.00(Ft.)
Length along longest watercourse = 0.475 Mi.
Length along longest watercourse measured to centroid = 0.246 Mi.
Difference in elevation = 230.00(Ft.)
Slope along watercourse = 484.5970 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.098 Hr.
Lag time = 5.90 Min.
25% of lag time = 1.48 Min.
40% of lag time = 2.36 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	2.00	120.08

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
60.04	5.00	300.20

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 5.000(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 4.999(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
60.040	73.40	0.000

Total Area Entered = 60.04(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
73.4	87.0	0.164	0.000	0.164	1.000	0.164
					Sum (F) =	0.164

Area averaged mean soil loss (F) (In/Hr) = 0.164
Minimum soil loss rate ((In/Hr)) = 0.082
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	254.168	51.434	31.122
2	0.500	508.335	39.798	24.081
3	0.750	762.503	6.885	4.166
4	1.000	1016.671	1.884	1.140
			Sum = 100.000	Sum= 60.509

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.040	(0.289)	0.036	0.004
2	0.50	0.30	0.060	(0.286)	0.054	0.006
3	0.75	0.30	0.060	(0.282)	0.054	0.006
4	1.00	0.40	0.080	(0.279)	0.072	0.008
5	1.25	0.30	0.060	(0.276)	0.054	0.006
6	1.50	0.30	0.060	(0.273)	0.054	0.006
7	1.75	0.30	0.060	(0.269)	0.054	0.006
8	2.00	0.40	0.080	(0.266)	0.072	0.008
9	2.25	0.40	0.080	(0.263)	0.072	0.008
10	2.50	0.40	0.080	(0.260)	0.072	0.008
11	2.75	0.50	0.100	(0.256)	0.090	0.010
12	3.00	0.50	0.100	(0.253)	0.090	0.010
13	3.25	0.50	0.100	(0.250)	0.090	0.010
14	3.50	0.50	0.100	(0.247)	0.090	0.010
15	3.75	0.50	0.100	(0.244)	0.090	0.010
16	4.00	0.60	0.120	(0.241)	0.108	0.012
17	4.25	0.60	0.120	(0.238)	0.108	0.012
18	4.50	0.70	0.140	(0.235)	0.126	0.014
19	4.75	0.70	0.140	(0.232)	0.126	0.014
20	5.00	0.80	0.160	(0.229)	0.144	0.016
21	5.25	0.60	0.120	(0.226)	0.108	0.012
22	5.50	0.70	0.140	(0.223)	0.126	0.014
23	5.75	0.80	0.160	(0.220)	0.144	0.016
24	6.00	0.80	0.160	(0.217)	0.144	0.016
25	6.25	0.90	0.180	(0.214)	0.162	0.018
26	6.50	0.90	0.180	(0.211)	0.162	0.018
27	6.75	1.00	0.200	(0.209)	0.180	0.020
28	7.00	1.00	0.200	(0.206)	0.180	0.020
29	7.25	1.00	0.200	(0.203)	0.180	0.020
30	7.50	1.10	0.220	(0.200)	0.198	0.022
31	7.75	1.20	0.240	0.197	(0.216)	0.043
32	8.00	1.30	0.260	0.195	(0.234)	0.065
33	8.25	1.50	0.300	0.192	(0.270)	0.108
34	8.50	1.50	0.300	0.189	(0.270)	0.111
35	8.75	1.60	0.320	0.187	(0.288)	0.133
36	9.00	1.70	0.340	0.184	(0.306)	0.156
37	9.25	1.90	0.380	0.181	(0.342)	0.199
38	9.50	2.00	0.400	0.179	(0.360)	0.221

39	9.75	2.10	0.420	0.176	(0.378)	0.244
40	10.00	2.20	0.440	0.174	(0.396)	0.266
41	10.25	1.50	0.300	0.171	(0.270)	0.129
42	10.50	1.50	0.300	0.169	(0.270)	0.131
43	10.75	2.00	0.400	0.166	(0.360)	0.234
44	11.00	2.00	0.400	0.164	(0.360)	0.236
45	11.25	1.90	0.380	0.161	(0.342)	0.218
46	11.50	1.90	0.380	0.159	(0.342)	0.221
47	11.75	1.70	0.340	0.157	(0.306)	0.183
48	12.00	1.80	0.360	0.154	(0.324)	0.206
49	12.25	2.50	0.500	0.152	(0.450)	0.348
50	12.50	2.60	0.520	0.150	(0.468)	0.370
51	12.75	2.80	0.560	0.148	(0.504)	0.412
52	13.00	2.90	0.580	0.145	(0.522)	0.435
53	13.25	3.40	0.680	0.143	(0.612)	0.537
54	13.50	3.40	0.680	0.141	(0.612)	0.539
55	13.75	2.30	0.460	0.139	(0.414)	0.321
56	14.00	2.30	0.460	0.137	(0.414)	0.323
57	14.25	2.70	0.540	0.135	(0.486)	0.405
58	14.50	2.60	0.520	0.133	(0.468)	0.387
59	14.75	2.60	0.520	0.131	(0.468)	0.389
60	15.00	2.50	0.500	0.129	(0.450)	0.371
61	15.25	2.40	0.480	0.127	(0.432)	0.353
62	15.50	2.30	0.460	0.125	(0.414)	0.335
63	15.75	1.90	0.380	0.123	(0.342)	0.257
64	16.00	1.90	0.380	0.121	(0.342)	0.259
65	16.25	0.40	0.080	(0.119)	0.072	0.008
66	16.50	0.40	0.080	(0.117)	0.072	0.008
67	16.75	0.30	0.060	(0.115)	0.054	0.006
68	17.00	0.30	0.060	(0.114)	0.054	0.006
69	17.25	0.50	0.100	(0.112)	0.090	0.010
70	17.50	0.50	0.100	(0.110)	0.090	0.010
71	17.75	0.50	0.100	(0.109)	0.090	0.010
72	18.00	0.40	0.080	(0.107)	0.072	0.008
73	18.25	0.40	0.080	(0.105)	0.072	0.008
74	18.50	0.40	0.080	(0.104)	0.072	0.008
75	18.75	0.30	0.060	(0.102)	0.054	0.006
76	19.00	0.20	0.040	(0.101)	0.036	0.004
77	19.25	0.30	0.060	(0.100)	0.054	0.006
78	19.50	0.40	0.080	(0.098)	0.072	0.008
79	19.75	0.30	0.060	(0.097)	0.054	0.006
80	20.00	0.20	0.040	(0.096)	0.036	0.004
81	20.25	0.30	0.060	(0.094)	0.054	0.006
82	20.50	0.30	0.060	(0.093)	0.054	0.006
83	20.75	0.30	0.060	(0.092)	0.054	0.006
84	21.00	0.20	0.040	(0.091)	0.036	0.004
85	21.25	0.30	0.060	(0.090)	0.054	0.006
86	21.50	0.20	0.040	(0.089)	0.036	0.004
87	21.75	0.30	0.060	(0.088)	0.054	0.006
88	22.00	0.20	0.040	(0.087)	0.036	0.004
89	22.25	0.30	0.060	(0.086)	0.054	0.006
90	22.50	0.20	0.040	(0.085)	0.036	0.004
91	22.75	0.20	0.040	(0.084)	0.036	0.004
92	23.00	0.20	0.040	(0.084)	0.036	0.004
93	23.25	0.20	0.040	(0.083)	0.036	0.004
94	23.50	0.20	0.040	(0.083)	0.036	0.004
95	23.75	0.20	0.040	(0.082)	0.036	0.004
96	24.00	0.20	0.040	(0.082)	0.036	0.004

(Loss Rate Not Used)

Sum = 100.0 Sum = 9.7

Flood volume = Effective rainfall 2.42(In)
times area 60.0(Ac.)/[(In)/(Ft.)] = 12.1(Ac.Ft)
Total soil loss = 2.57(In)
Total soil loss = 12.883(Ac.Ft)
Total rainfall = 5.00(In)
Flood volume = 528434.0 Cubic Feet
Total soil loss = 561164.2 Cubic Feet

Peak flow rate of this hydrograph = 31.997(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 10.0 20.0 30.0 40.0
0+15	0.0026	0.12	Q
0+30	0.0084	0.28	Q
0+45	0.0156	0.35	Q
1+ 0	0.0244	0.42	Q
1+15	0.0329	0.41	Q
1+30	0.0405	0.37	Q
1+45	0.0481	0.37	Q
2+ 0	0.0569	0.43	Q
2+15	0.0667	0.47	Q
2+30	0.0766	0.48	Q
2+45	0.0879	0.55	Q
3+ 0	0.1002	0.59	Q
3+15	0.1127	0.60	Q
3+30	0.1252	0.61	Q
3+45	0.1377	0.61	Q
4+ 0	0.1515	0.67	Q
4+15	0.1663	0.72	Q
4+30	0.1825	0.79	Q
4+45	0.1998	0.84	Q
5+ 0	0.2185	0.91	Q
5+15	0.2358	0.83	Q
5+30	0.2524	0.81	Q
5+45	0.2711	0.90	Q
6+ 0	0.2909	0.96	Q
6+15	0.3121	1.03	Q
6+30	0.3344	1.08	Q
6+45	0.3582	1.15	Q
7+ 0	0.3830	1.20	Q
7+15	0.4079	1.21	Q
7+30	0.4342	1.27	Q
7+45	0.4747	1.96	Q
8+ 0	0.5403	3.17	V Q
8+15	0.6464	5.14	V Q
8+30	0.7780	6.37	V Q
8+45	0.9297	7.34	V Q
9+ 0	1.1084	8.65	V Q
9+15	1.3279	10.62	V Q
9+30	1.5855	12.47	V Q
9+45	1.8731	13.92	V Q
10+ 0	2.1894	15.31	V Q
10+15	2.4309	11.69	V Q
10+30	2.6081	8.57	Q
10+45	2.8411	11.28	V Q
11+ 0	3.1236	13.67	V Q
11+15	3.4049	13.62	V Q
11+30	3.6816	13.39	V Q
11+45	3.9338	12.21	Q
12+ 0	4.1815	11.99	Q V
12+15	4.5286	16.80	V Q
12+30	4.9619	20.97	V Q
12+45	5.4462	23.44	V Q
13+ 0	5.9712	25.41	V Q
13+15	6.5771	29.33	V Q
13+30	7.2382	32.00	V Q
13+45	7.7696	25.72	Q
14+ 0	8.1964	20.66	Q V
14+15	8.6584	22.36	Q V
14+30	9.1448	23.54	Q V
14+45	9.6307	23.52	Q V
15+ 0	10.1064	23.02	Q V
15+15	10.5612	22.02	Q V
15+30	10.9940	20.95	Q V
15+45	11.3656	17.98	Q V

```
  16+ 0      11.6975     16.07  |          |      Q   |          |        V |
  16+15      11.8617      7.95  |       Q  |          |          |         V|
  16+30      11.8992      1.82  |Q         |          |          |         V|
  16+45      11.9138      0.71  Q          |          |          |         V|
  17+ 0      11.9216      0.37  Q          |          |          |         V|
  17+15      11.9317      0.49  Q          |          |          |         V|
  17+30      11.9438      0.58  Q          |          |          |         V|
  17+45      11.9562      0.60  Q          |          |          |         V|
  18+ 0      11.9674      0.54  Q          |          |          |         V|
  18+15      11.9776      0.49  Q          |          |          |         V|
  18+30      11.9877      0.49  Q          |          |          |         V|
  18+45      11.9964      0.42  Q          |          |          |         V|
  19+ 0      12.0028      0.31  Q          |          |          |         V|
  19+15      12.0094      0.32  Q          |          |          |         V|
  19+30      12.0180      0.42  Q          |          |          |         V|
  19+45      12.0265      0.41  Q          |          |          |         V|
  20+ 0      12.0328      0.31  Q          |          |          |         V|
  20+15      12.0394      0.32  Q          |          |          |         V|
  20+30      12.0467      0.35  Q          |          |          |         V|
  20+45      12.0542      0.36  Q          |          |          |         V|
  21+ 0      12.0604      0.30  Q          |          |          |         V|
  21+15      12.0669      0.32  Q          |          |          |         V|
  21+30      12.0730      0.29  Q          |          |          |         V|
  21+45      12.0794      0.31  Q          |          |          |         V|
  22+ 0      12.0855      0.29  Q          |          |          |         V|
  22+15      12.0919      0.31  Q          |          |          |         V|
  22+30      12.0980      0.29  Q          |          |          |         V|
  22+45      12.1032      0.25  Q          |          |          |         V|
  23+ 0      12.1082      0.24  Q          |          |          |         V|
  23+15      12.1132      0.24  Q          |          |          |         V|
  23+30      12.1182      0.24  Q          |          |          |         V|
  23+45      12.1232      0.24  Q          |          |          |         V|
  24+ 0      12.1282      0.24  Q          |          |          |         V|
  24+15      12.1306      0.12  Q          |          |          |         V|
  24+30      12.1311      0.02  Q          |          |          |         V|
  24+45      12.1312      0.00  Q          |          |          |          V
-------------------------------------------------------------------------
```

- Area 'D' – 2 Year - Post-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRD00212.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	0.55	30.71

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	1.30	72.59

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 0.550(In)
Areal adjustment factor = 99.95 %
Adjusted average point rain = 0.550(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

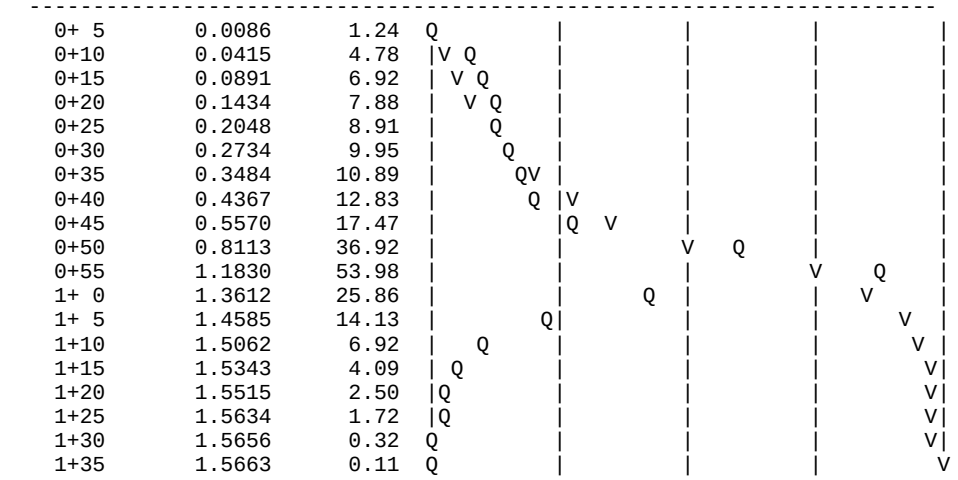
```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
65.7  45.8      0.613     0.500        0.337       1.000      0.337
                                                 Sum (F) =   0.337
Area averaged mean soil loss (F) (In/Hr) =  0.337
Minimum soil loss rate ((In/Hr)) =  0.169
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5300
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083        101.508         19.663             11.066
    2   0.167        203.015         48.509             27.299
    3   0.250        304.523         15.411              8.673
    4   0.333        406.031          6.983              3.930
    5   0.417        507.539          3.915              2.203
    6   0.500        609.046          2.530              1.424
    7   0.583        710.554          1.553              0.874
    8   0.667        812.062          1.435              0.808
                              Sum = 100.000   Sum=      56.276
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

 Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
      (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
  1   0.08     3.40      0.224       (  0.337)       0.112        0.112
  2   0.17     4.70      0.310       (  0.337)       0.155        0.155
  3   0.25     4.70      0.310       (  0.337)       0.155        0.155
  4   0.33     5.10      0.336       (  0.337)       0.168        0.168
  5   0.42     5.80      0.383       (  0.337)       0.191        0.191
  6   0.50     5.90      0.389       (  0.337)       0.195        0.195
  7   0.58     7.10      0.468       (  0.337)       0.234        0.234
  8   0.67     8.70      0.574       (  0.337)       0.287        0.287
  9   0.75    13.20      0.871          0.337    (  0.435)        0.534
 10   0.83    29.70      1.959          0.337    (  0.980)        1.622
 11   0.92     7.70      0.508       (  0.337)       0.254        0.254
 12   1.00     4.00      0.264       (  0.337)       0.132        0.132
              (Loss Rate Not Used)
    Sum =     100.0                                  Sum =     4.0
      Flood volume = Effective rainfall      0.34(In)
       times area      55.8(Ac.)/[(In)/(Ft.)] =       1.6(Ac.Ft)
      Total soil loss =      0.21(In)
      Total soil loss =     0.992(Ac.Ft)
      Total rainfall =      0.55(In)
      Flood volume =       68229.7 Cubic Feet
      Total soil loss =       43198.4 Cubic Feet
      ------------------------------------------------------------------
       Peak flow rate of this hydrograph =     53.975(CFS)
      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
      ------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

      ------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
```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0+10 0.0415 4.78
0+15 0.0891 6.92
0+20 0.1434 7.88
0+25 0.2048 8.91
0+30 0.2734 9.95
0+35 0.3484 10.89
0+40 0.4367 12.83
0+45 0.5570 17.47
0+50 0.8113 36.92
0+55 1.1830 53.98
1+ 0 1.3612 25.86
1+ 5 1.4585 14.13
1+10 1.5062 6.92
1+15 1.5343 4.09
1+20 1.5515 2.50
1+25 1.5634 1.72
1+30 1.5656 0.32
1+35 1.5663 0.11

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRD00232.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	0.85	47.46

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	2.00	111.68

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 0.850(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 0.850(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
65.7	45.8	0.613	0.500	0.337	1.000	0.337
					Sum (F) =	0.337

Area averaged mean soil loss (F) (In/Hr) = 0.337
Minimum soil loss rate ((In/Hr)) = 0.169
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	101.508	19.663	11.066
2	0.167	203.015	48.509	27.299
3	0.250	304.523	15.411	8.673
4	0.333	406.031	6.983	3.930
5	0.417	507.539	3.915	2.203
6	0.500	609.046	2.530	1.424
7	0.583	710.554	1.553	0.874
8	0.667	812.062	1.435	0.808
			Sum = 100.000	Sum= 56.276

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.133	(0.337)	0.066	0.066
2	0.17	1.30	0.133	(0.337)	0.066	0.066
3	0.25	1.10	0.112	(0.337)	0.056	0.056
4	0.33	1.50	0.153	(0.337)	0.076	0.076
5	0.42	1.50	0.153	(0.337)	0.076	0.076
6	0.50	1.80	0.184	(0.337)	0.092	0.092
7	0.58	1.50	0.153	(0.337)	0.076	0.076
8	0.67	1.80	0.184	(0.337)	0.092	0.092
9	0.75	1.80	0.184	(0.337)	0.092	0.092
10	0.83	1.50	0.153	(0.337)	0.076	0.076
11	0.92	1.60	0.163	(0.337)	0.082	0.082
12	1.00	1.80	0.184	(0.337)	0.092	0.092
13	1.08	2.20	0.224	(0.337)	0.112	0.112
14	1.17	2.20	0.224	(0.337)	0.112	0.112
15	1.25	2.20	0.224	(0.337)	0.112	0.112
16	1.33	2.00	0.204	(0.337)	0.102	0.102
17	1.42	2.60	0.265	(0.337)	0.133	0.133
18	1.50	2.70	0.275	(0.337)	0.138	0.138
19	1.58	2.40	0.245	(0.337)	0.122	0.122
20	1.67	2.70	0.275	(0.337)	0.138	0.138
21	1.75	3.30	0.337	(0.337)	0.168	0.168
22	1.83	3.10	0.316	(0.337)	0.158	0.158
23	1.92	2.90	0.296	(0.337)	0.148	0.148
24	2.00	3.00	0.306	(0.337)	0.153	0.153
25	2.08	3.10	0.316	(0.337)	0.158	0.158
26	2.17	4.20	0.428	(0.337)	0.214	0.214
27	2.25	5.00	0.510	(0.337)	0.255	0.255
28	2.33	3.50	0.357	(0.337)	0.178	0.178
29	2.42	6.80	0.693	0.337	(0.347)	0.356
30	2.50	7.30	0.744	0.337	(0.372)	0.407
31	2.58	8.20	0.836	0.337	(0.418)	0.499
32	2.67	5.90	0.602	(0.337)	0.301	0.301
33	2.75	2.00	0.204	(0.337)	0.102	0.102
34	2.83	1.80	0.184	(0.337)	0.092	0.092

```
35   2.92     1.80      0.184       (  0.337)       0.092        0.092
36   3.00     0.60      0.061       (  0.337)       0.031        0.031
             (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     5.2
      Flood volume = Effective rainfall      0.44(In)
       times area      55.8(Ac.)/[(In)/(Ft.)] =       2.0(Ac.Ft)
      Total soil loss =      0.41(In)
      Total soil loss =     1.928(Ac.Ft)
      Total rainfall =      0.85(In)
      Flood volume =       88253.7 Cubic Feet
      Total soil loss =       83998.5 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     22.973(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
  ------------------------------------------------------------------------
    0+ 5       0.0051      0.73  Q         |         |         |         |
    0+10       0.0226      2.54  V  Q      |         |         |         |
    0+15       0.0433      3.01  V   Q     |         |         |         |
    0+20       0.0654      3.21  |V  Q     |         |         |         |
    0+25       0.0918      3.83  |V   Q    |         |         |         |
    0+30       0.1209      4.23  | V  Q    |         |         |         |
    0+35       0.1526      4.59  |  V  Q   |         |         |         |
    0+40       0.1840      4.56  |  V  Q   |         |         |         |
    0+45       0.2179      4.93  |   V Q   |         |         |         |
    0+50       0.2515      4.87  |   V Q   |         |         |         |
    0+55       0.2830      4.58  |    VQ   |         |         |         |
    1+ 0       0.3155      4.72  |     Q   |         |         |         |
    1+ 5       0.3516      5.23  |     Q   |         |         |         |
    1+10       0.3919      5.86  |      Q  |         |         |         |
    1+15       0.4338      6.08  |       Q |         |         |         |
    1+20       0.4756      6.07  |       QV|         |         |         |
    1+25       0.5182      6.18  |       Q V         |         |         |
    1+30       0.5666      7.02  |        Q|V        |         |         |
    1+35       0.6165      7.25  |        Q| V       |         |         |
    1+40       0.6657      7.16  |        Q|  V      |         |         |
    1+45       0.7198      7.85  |         Q   V     |         |         |
    1+50       0.7797      8.69  |         |Q   V    |         |         |
    1+55       0.8391      8.62  |         |Q    V   |         |         |
    2+ 0       0.8974      8.47  |         |Q     V  |         |         |
    2+ 5       0.9567      8.62  |         |Q      V |         |         |
    2+10       1.0215      9.40  |         | Q       V         |         |
    2+15       1.1004     11.45  |         |    Q    |V        |         |
    2+20       1.1847     12.24  |         |     Q   |  V      |         |
    2+25       1.2721     12.70  |         |     Q   |    V    |         |
    2+30       1.3944     17.75  |         |         |  Q   V  |         |
    2+35       1.5430     21.58  |         |         |       Q V         |
    2+40       1.7012     22.97  |         |         |         Q  V      |
    2+45       1.8163     16.71  |         |         | Q       |    V    |
    2+50       1.8861     10.14  |         |  Q      |         |      V  |
    2+55       1.9394      7.73  |        Q|         |         |       V |
    3+ 0       1.9811      6.06  |       Q |         |         |        V|
    3+ 5       2.0046      3.41  |   Q     |         |         |        V|
    3+10       2.0159      1.64  | Q       |         |         |        V|
    3+15       2.0213      0.79  |Q        |         |         |        V|
    3+20       2.0238      0.36  Q         |         |         |        V|
    3+25       2.0252      0.20  Q         |         |         |        V|
    3+30       2.0259      0.10  Q         |         |         |        V|
    3+35       2.0260      0.02  Q         |         |         |        V|
------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRD00262.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	1.20	67.01

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	3.00	167.52

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 1.200(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.200(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
65.7	45.8	0.613	0.500	0.337	1.000	0.337
					Sum (F) =	0.337

Area averaged mean soil loss (F) (In/Hr) = 0.337
Minimum soil loss rate ((In/Hr)) = 0.169
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	101.508	19.663	11.066
2	0.167	203.015	48.509	27.299
3	0.250	304.523	15.411	8.673
4	0.333	406.031	6.983	3.930
5	0.417	507.539	3.915	2.203
6	0.500	609.046	2.530	1.424
7	0.583	710.554	1.553	0.874
8	0.667	812.062	1.435	0.808
			Sum = 100.000	Sum= 56.276

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.072	(0.337)	0.036	0.036
2	0.17	0.60	0.086	(0.337)	0.043	0.043
3	0.25	0.60	0.086	(0.337)	0.043	0.043
4	0.33	0.60	0.086	(0.337)	0.043	0.043
5	0.42	0.60	0.086	(0.337)	0.043	0.043
6	0.50	0.70	0.101	(0.337)	0.050	0.050
7	0.58	0.70	0.101	(0.337)	0.050	0.050
8	0.67	0.70	0.101	(0.337)	0.050	0.050
9	0.75	0.70	0.101	(0.337)	0.050	0.050
10	0.83	0.70	0.101	(0.337)	0.050	0.050
11	0.92	0.70	0.101	(0.337)	0.050	0.050
12	1.00	0.80	0.115	(0.337)	0.058	0.058
13	1.08	0.80	0.115	(0.337)	0.058	0.058
14	1.17	0.80	0.115	(0.337)	0.058	0.058
15	1.25	0.80	0.115	(0.337)	0.058	0.058
16	1.33	0.80	0.115	(0.337)	0.058	0.058
17	1.42	0.80	0.115	(0.337)	0.058	0.058
18	1.50	0.80	0.115	(0.337)	0.058	0.058
19	1.58	0.80	0.115	(0.337)	0.058	0.058
20	1.67	0.80	0.115	(0.337)	0.058	0.058
21	1.75	0.80	0.115	(0.337)	0.058	0.058
22	1.83	0.80	0.115	(0.337)	0.058	0.058
23	1.92	0.80	0.115	(0.337)	0.058	0.058
24	2.00	0.90	0.130	(0.337)	0.065	0.065
25	2.08	0.80	0.115	(0.337)	0.058	0.058
26	2.17	0.90	0.130	(0.337)	0.065	0.065
27	2.25	0.90	0.130	(0.337)	0.065	0.065
28	2.33	0.90	0.130	(0.337)	0.065	0.065
29	2.42	0.90	0.130	(0.337)	0.065	0.065
30	2.50	0.90	0.130	(0.337)	0.065	0.065
31	2.58	0.90	0.130	(0.337)	0.065	0.065
32	2.67	0.90	0.130	(0.337)	0.065	0.065
33	2.75	1.00	0.144	(0.337)	0.072	0.072
34	2.83	1.00	0.144	(0.337)	0.072	0.072

```
35   2.92     1.00      0.144       (  0.337)       0.072        0.072
36   3.00     1.00      0.144       (  0.337)       0.072        0.072
37   3.08     1.00      0.144       (  0.337)       0.072        0.072
38   3.17     1.10      0.158       (  0.337)       0.079        0.079
39   3.25     1.10      0.158       (  0.337)       0.079        0.079
40   3.33     1.10      0.158       (  0.337)       0.079        0.079
41   3.42     1.20      0.173       (  0.337)       0.086        0.086
42   3.50     1.30      0.187       (  0.337)       0.094        0.094
43   3.58     1.40      0.202       (  0.337)       0.101        0.101
44   3.67     1.40      0.202       (  0.337)       0.101        0.101
45   3.75     1.50      0.216       (  0.337)       0.108        0.108
46   3.83     1.50      0.216       (  0.337)       0.108        0.108
47   3.92     1.60      0.230       (  0.337)       0.115        0.115
48   4.00     1.60      0.230       (  0.337)       0.115        0.115
49   4.08     1.70      0.245       (  0.337)       0.122        0.122
50   4.17     1.80      0.259       (  0.337)       0.130        0.130
51   4.25     1.90      0.274       (  0.337)       0.137        0.137
52   4.33     2.00      0.288       (  0.337)       0.144        0.144
53   4.42     2.10      0.302       (  0.337)       0.151        0.151
54   4.50     2.10      0.302       (  0.337)       0.151        0.151
55   4.58     2.20      0.317       (  0.337)       0.158        0.158
56   4.67     2.30      0.331       (  0.337)       0.166        0.166
57   4.75     2.40      0.346       (  0.337)       0.173        0.173
58   4.83     2.40      0.346       (  0.337)       0.173        0.173
59   4.92     2.50      0.360       (  0.337)       0.180        0.180
60   5.00     2.60      0.374       (  0.337)       0.187        0.187
61   5.08     3.10      0.446       (  0.337)       0.223        0.223
62   5.17     3.60      0.518       (  0.337)       0.259        0.259
63   5.25     3.90      0.561       (  0.337)       0.281        0.281
64   5.33     4.20      0.605       (  0.337)       0.302        0.302
65   5.42     4.70      0.677          0.337    (  0.338)       0.340
66   5.50     5.60      0.806          0.337    (  0.403)       0.469
67   5.58     1.90      0.274       (  0.337)       0.137        0.137
68   5.67     0.90      0.130       (  0.337)       0.065        0.065
69   5.75     0.60      0.086       (  0.337)       0.043        0.043
70   5.83     0.50      0.072       (  0.337)       0.036        0.036
71   5.92     0.30      0.043       (  0.337)       0.022        0.022
72   6.00     0.20      0.029       (  0.337)       0.014        0.014
             (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     7.3
      Flood volume = Effective rainfall      0.61(In)
       times area      55.8(Ac.)/[(In)/(Ft.)] =       2.8(Ac.Ft)
      Total soil loss =      0.59(In)
      Total soil loss =     2.765(Ac.Ft)
      Total rainfall =      1.20(In)
      Flood volume =      122734.9 Cubic Feet
      Total soil loss =      120457.5 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     19.801(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-------------------------------------------------------------------------
  0+ 5       0.0027      0.40  Q         |         |         |         |
  0+10       0.0128      1.46  V Q       |         |         |         |
  0+15       0.0264      1.97  V  Q      |         |         |         |
  0+20       0.0414      2.17  V   Q     |         |         |         |
  0+25       0.0571      2.28  V   Q     |         |         |         |
  0+30       0.0738      2.43  |V  Q     |         |         |         |
  0+35       0.0922      2.67  |V   Q    |         |         |         |
  0+40       0.1112      2.76  |V   Q    |         |         |         |
  0+45       0.1305      2.80  |V   Q    |         |         |         |
  0+50       0.1499      2.81  | V  Q    |         |         |         |
  0+55       0.1693      2.83  | V  Q    |         |         |         |
  1+ 0       0.1894      2.91  | V  Q    |         |         |         |
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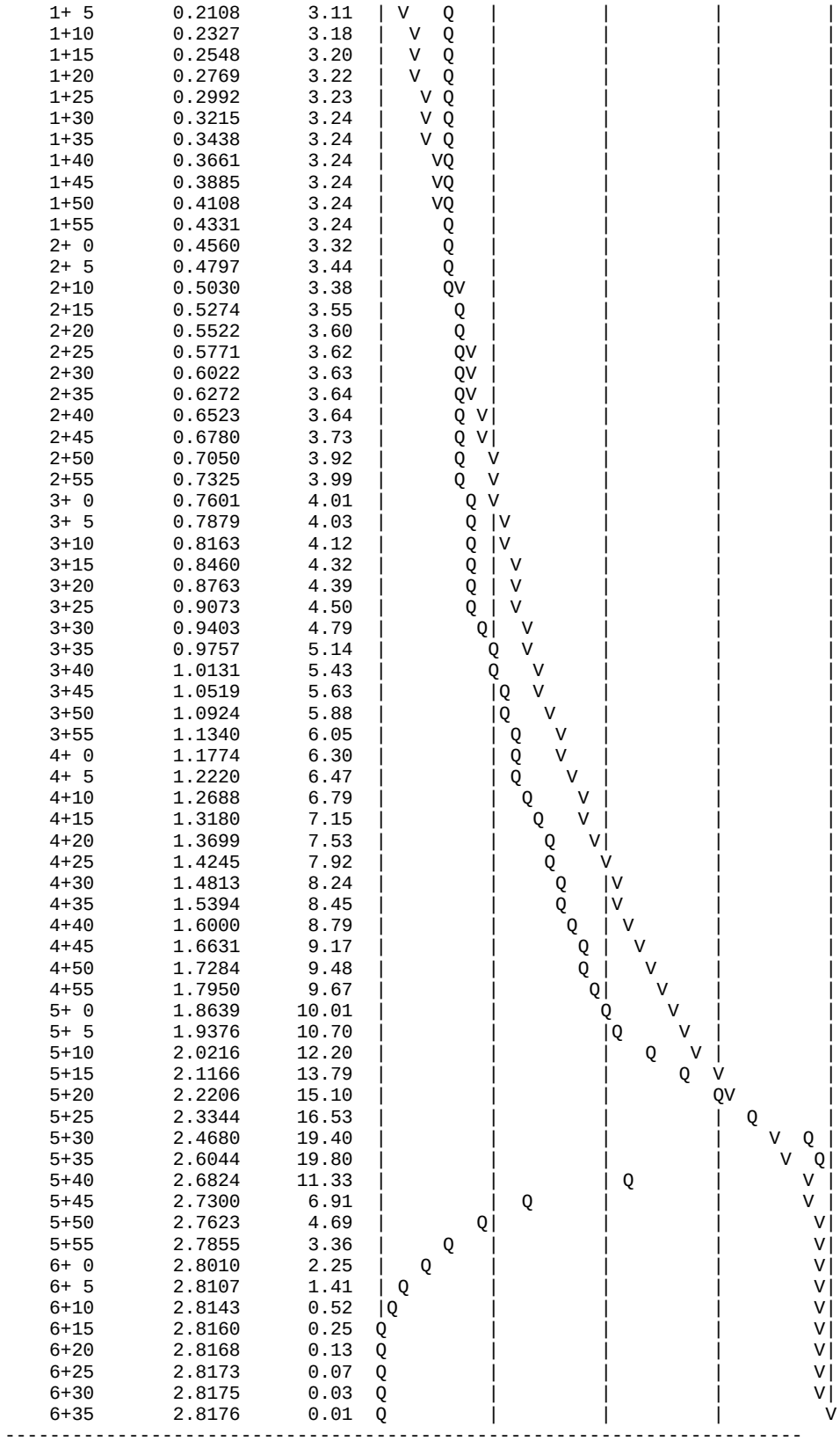

U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: PRD002242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 2 YEAR HOUR STORM
HUNSAKER & ASSOCIATES, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	2.00	111.68

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	5.00	279.20

STORM EVENT (YEAR) = 2.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 2.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

RI AMC2	RI AMC-1	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
65.7	45.8	0.613	0.500	0.337	1.000	0.337
					Sum (F) =	0.337

Area averaged mean soil loss (F) (In/Hr) = 0.337
Minimum soil loss rate ((In/Hr)) = 0.169
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	304.523	57.140	32.156
2	0.500	609.046	36.881	20.755
3	0.750	913.570	5.980	3.365
			Sum = 100.000	Sum= 56.276

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.016	(0.595)	0.008	0.008
2	0.50	0.30	0.024	(0.588)	0.012	0.012
3	0.75	0.30	0.024	(0.581)	0.012	0.012
4	1.00	0.40	0.032	(0.575)	0.016	0.016
5	1.25	0.30	0.024	(0.568)	0.012	0.012
6	1.50	0.30	0.024	(0.561)	0.012	0.012
7	1.75	0.30	0.024	(0.554)	0.012	0.012
8	2.00	0.40	0.032	(0.548)	0.016	0.016
9	2.25	0.40	0.032	(0.541)	0.016	0.016
10	2.50	0.40	0.032	(0.534)	0.016	0.016
11	2.75	0.50	0.040	(0.528)	0.020	0.020
12	3.00	0.50	0.040	(0.521)	0.020	0.020
13	3.25	0.50	0.040	(0.515)	0.020	0.020
14	3.50	0.50	0.040	(0.509)	0.020	0.020
15	3.75	0.50	0.040	(0.502)	0.020	0.020
16	4.00	0.60	0.048	(0.496)	0.024	0.024
17	4.25	0.60	0.048	(0.490)	0.024	0.024
18	4.50	0.70	0.056	(0.483)	0.028	0.028
19	4.75	0.70	0.056	(0.477)	0.028	0.028
20	5.00	0.80	0.064	(0.471)	0.032	0.032
21	5.25	0.60	0.048	(0.465)	0.024	0.024
22	5.50	0.70	0.056	(0.459)	0.028	0.028
23	5.75	0.80	0.064	(0.453)	0.032	0.032
24	6.00	0.80	0.064	(0.447)	0.032	0.032
25	6.25	0.90	0.072	(0.441)	0.036	0.036
26	6.50	0.90	0.072	(0.435)	0.036	0.036
27	6.75	1.00	0.080	(0.429)	0.040	0.040
28	7.00	1.00	0.080	(0.423)	0.040	0.040
29	7.25	1.00	0.080	(0.418)	0.040	0.040
30	7.50	1.10	0.088	(0.412)	0.044	0.044
31	7.75	1.20	0.096	(0.406)	0.048	0.048
32	8.00	1.30	0.104	(0.401)	0.052	0.052
33	8.25	1.50	0.120	(0.395)	0.060	0.060
34	8.50	1.50	0.120	(0.390)	0.060	0.060
35	8.75	1.60	0.128	(0.384)	0.064	0.064
36	9.00	1.70	0.136	(0.379)	0.068	0.068
37	9.25	1.90	0.152	(0.373)	0.076	0.076
38	9.50	2.00	0.160	(0.368)	0.080	0.080
39	9.75	2.10	0.168	(0.363)	0.084	0.084

40	10.00	2.20	0.176	(0.358)	0.088	0.088
41	10.25	1.50	0.120	(0.352)	0.060	0.060
42	10.50	1.50	0.120	(0.347)	0.060	0.060
43	10.75	2.00	0.160	(0.342)	0.080	0.080
44	11.00	2.00	0.160	(0.337)	0.080	0.080
45	11.25	1.90	0.152	(0.332)	0.076	0.076
46	11.50	1.90	0.152	(0.327)	0.076	0.076
47	11.75	1.70	0.136	(0.323)	0.068	0.068
48	12.00	1.80	0.144	(0.318)	0.072	0.072
49	12.25	2.50	0.200	(0.313)	0.100	0.100
50	12.50	2.60	0.208	(0.308)	0.104	0.104
51	12.75	2.80	0.224	(0.304)	0.112	0.112
52	13.00	2.90	0.232	(0.299)	0.116	0.116
53	13.25	3.40	0.272	(0.295)	0.136	0.136
54	13.50	3.40	0.272	(0.290)	0.136	0.136
55	13.75	2.30	0.184	(0.286)	0.092	0.092
56	14.00	2.30	0.184	(0.281)	0.092	0.092
57	14.25	2.70	0.216	(0.277)	0.108	0.108
58	14.50	2.60	0.208	(0.273)	0.104	0.104
59	14.75	2.60	0.208	(0.269)	0.104	0.104
60	15.00	2.50	0.200	(0.265)	0.100	0.100
61	15.25	2.40	0.192	(0.261)	0.096	0.096
62	15.50	2.30	0.184	(0.257)	0.092	0.092
63	15.75	1.90	0.152	(0.253)	0.076	0.076
64	16.00	1.90	0.152	(0.249)	0.076	0.076
65	16.25	0.40	0.032	(0.245)	0.016	0.016
66	16.50	0.40	0.032	(0.241)	0.016	0.016
67	16.75	0.30	0.024	(0.238)	0.012	0.012
68	17.00	0.30	0.024	(0.234)	0.012	0.012
69	17.25	0.50	0.040	(0.230)	0.020	0.020
70	17.50	0.50	0.040	(0.227)	0.020	0.020
71	17.75	0.50	0.040	(0.224)	0.020	0.020
72	18.00	0.40	0.032	(0.220)	0.016	0.016
73	18.25	0.40	0.032	(0.217)	0.016	0.016
74	18.50	0.40	0.032	(0.214)	0.016	0.016
75	18.75	0.30	0.024	(0.211)	0.012	0.012
76	19.00	0.20	0.016	(0.208)	0.008	0.008
77	19.25	0.30	0.024	(0.205)	0.012	0.012
78	19.50	0.40	0.032	(0.202)	0.016	0.016
79	19.75	0.30	0.024	(0.199)	0.012	0.012
80	20.00	0.20	0.016	(0.197)	0.008	0.008
81	20.25	0.30	0.024	(0.194)	0.012	0.012
82	20.50	0.30	0.024	(0.191)	0.012	0.012
83	20.75	0.30	0.024	(0.189)	0.012	0.012
84	21.00	0.20	0.016	(0.187)	0.008	0.008
85	21.25	0.30	0.024	(0.185)	0.012	0.012
86	21.50	0.20	0.016	(0.182)	0.008	0.008
87	21.75	0.30	0.024	(0.180)	0.012	0.012
88	22.00	0.20	0.016	(0.179)	0.008	0.008
89	22.25	0.30	0.024	(0.177)	0.012	0.012
90	22.50	0.20	0.016	(0.175)	0.008	0.008
91	22.75	0.20	0.016	(0.174)	0.008	0.008
92	23.00	0.20	0.016	(0.172)	0.008	0.008
93	23.25	0.20	0.016	(0.171)	0.008	0.008
94	23.50	0.20	0.016	(0.170)	0.008	0.008
95	23.75	0.20	0.016	(0.169)	0.008	0.008
96	24.00	0.20	0.016	(0.169)	0.008	0.008

(Loss Rate Not Used)

Sum = 100.0 Sum = 4.0

Flood volume = Effective rainfall 1.00(In)
times area 55.8(Ac.)/[(In)/(Ft.)] = 4.7(Ac.Ft)
Total soil loss = 1.00(In)
Total soil loss = 4.653(Ac.Ft)
Total rainfall = 2.00(In)
Flood volume = 202677.1 Cubic Feet
Total soil loss = 202677.1 Cubic Feet

Peak flow rate of this hydrograph = 7.589(CFS)

++

24 - H O U R S T O R M

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+15	0.0053	0.26	VQ				
0+30	0.0167	0.55	V Q				
0+45	0.0304	0.66	V Q				
1+ 0	0.0470	0.80	V Q				
1+15	0.0627	0.76	V Q				
1+30	0.0769	0.69	V Q				
1+45	0.0909	0.68	V Q				
2+ 0	0.1075	0.80	V Q				
2+15	0.1258	0.89	V Q				
2+30	0.1445	0.90	V Q				
2+45	0.1657	1.03	V Q				
3+ 0	0.1887	1.11	V Q				
3+15	0.2120	1.13	V Q				
3+30	0.2352	1.13	V Q				
3+45	0.2585	1.13	V Q				
4+ 0	0.2844	1.25	V Q				
4+15	0.3121	1.34	V Q				
4+30	0.3426	1.48	V Q				
4+45	0.3749	1.56	V Q				
5+ 0	0.4102	1.71	V Q				
5+15	0.4418	1.53	V Q				
5+30	0.4729	1.51	V Q				
5+45	0.5079	1.69	V Q				
6+ 0	0.5448	1.79	V Q				
6+15	0.5847	1.93	V Q				
6+30	0.6263	2.01	V Q				
6+45	0.6708	2.16	V Q				
7+ 0	0.7171	2.24	V Q				
7+15	0.7636	2.25	V Q				
7+30	0.8128	2.38	V Q				
7+45	0.8664	2.59	V Q				
8+ 0	0.9246	2.82	V Q				
8+15	0.9901	3.17	V Q				
8+30	1.0593	3.35	V Q				
8+45	1.1318	3.51	V Q				
9+ 0	1.2086	3.72	V Q				
9+15	1.2927	4.07	V Q				
9+30	1.3832	4.38	V Q				
9+45	1.4787	4.62	V Q				
10+ 0	1.5788	4.84	V Q				
10+15	1.6622	4.04	V Q				
10+30	1.7340	3.47	QV				
10+45	1.8171	4.02	VQ				
11+ 0	1.9087	4.44	VQ				
11+15	1.9991	4.38	Q				
11+30	2.0878	4.29	Q				
11+45	2.1709	4.02	Q V				
12+ 0	2.2532	3.98	Q V				
12+15	2.3553	4.94	QV				
12+30	2.4723	5.66	VQ				
12+45	2.5983	6.10	V Q				
13+ 0	2.7307	6.41	V Q				
13+15	2.8787	7.16	V Q				
13+30	3.0355	7.59	V Q				
13+45	3.1644	6.24	Q V				
14+ 0	3.2745	5.33	Q V				
14+15	3.3922	5.69	Q V				
14+30	3.5140	5.90	Q V				
14+45	3.6353	5.87	Q V				
15+ 0	3.7536	5.73	Q V				
15+15	3.8675	5.51	Q V				
15+30	3.9768	5.29	Q V				
15+45	4.0735	4.68	Q V				
16+ 0	4.1630	4.33	Q V				

```
   16+15       4.2115      2.35  |         Q|          |          |      V   |
   16+30       4.2343      1.10  |    Q     |          |          |      V   |
   16+45       4.2502      0.77  |  Q       |          |          |      V   |
   17+ 0       4.2645      0.69  | Q        |          |          |      V   |
   17+15       4.2838      0.93  |  Q       |          |          |      V   |
   17+30       4.3065      1.10  |   Q      |          |          |       V  |
   17+45       4.3297      1.13  |   Q      |          |          |       V  |
   18+ 0       4.3503      1.00  |  Q       |          |          |       V  |
   18+15       4.3692      0.91  |  Q       |          |          |       V  |
   18+30       4.3878      0.90  |  Q       |          |          |       V  |
   18+45       4.4038      0.77  |  Q       |          |          |       V  |
   19+ 0       4.4154      0.56  | Q        |          |          |       V  |
   19+15       4.4276      0.59  | Q        |          |          |        V |
   19+30       4.4439      0.79  |  Q       |          |          |        V |
   19+45       4.4596      0.76  |  Q       |          |          |        V |
   20+ 0       4.4712      0.56  | Q        |          |          |        V |
   20+15       4.4834      0.59  | Q        |          |          |        V |
   20+30       4.4971      0.66  | Q        |          |          |        V |
   20+45       4.5111      0.68  | Q        |          |          |        V |
   21+ 0       4.5224      0.55  | Q        |          |          |        V |
   21+15       4.5346      0.59  | Q        |          |          |        V |
   21+30       4.5456      0.53  | Q        |          |          |         V|
   21+45       4.5579      0.59  | Q        |          |          |         V|
   22+ 0       4.5689      0.53  | Q        |          |          |         V|
   22+15       4.5811      0.59  | Q        |          |          |         V|
   22+30       4.5922      0.53  | Q        |          |          |         V|
   22+45       4.6018      0.46  |Q         |          |          |         V|
   23+ 0       4.6111      0.45  |Q         |          |          |         V|
   23+15       4.6204      0.45  |Q         |          |          |         V|
   23+30       4.6297      0.45  |Q         |          |          |         V|
   23+45       4.6390      0.45  |Q         |          |          |         V|
   24+ 0       4.6483      0.45  |Q         |          |          |         V|
   24+15       4.6523      0.19  Q          |          |          |         V|
   24+30       4.6528      0.03  Q          |          |          |          V
-------------------------------------------------------------------------------
```

- Area 'D' – 10 Year Post-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRD010110.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	0.55	30.71

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	1.30	72.59

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 0.859(In)
Areal adjustment factor = 99.95 %
Adjusted average point rain = 0.858(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

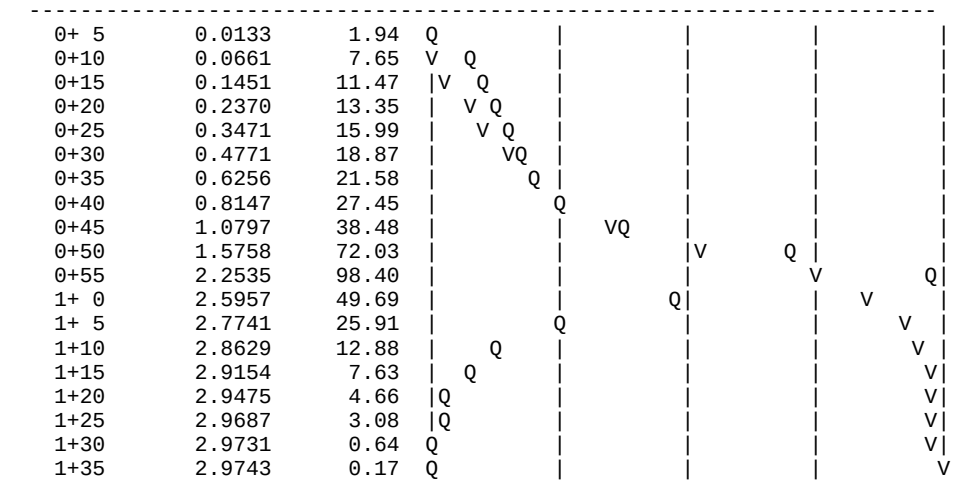
```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
65.7  65.7      0.408     0.500        0.225       1.000      0.225
                                                 Sum (F) =   0.225
Area averaged mean soil loss (F) (In/Hr) =  0.225
Minimum soil loss rate ((In/Hr)) =  0.112
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5300
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083        101.508         19.663             11.066
    2   0.167        203.015         48.509             27.299
    3   0.250        304.523         15.411              8.673
    4   0.333        406.031          6.983              3.930
    5   0.417        507.539          3.915              2.203
    6   0.500        609.046          2.530              1.424
    7   0.583        710.554          1.553              0.874
    8   0.667        812.062          1.435              0.808
                              Sum = 100.000   Sum=      56.276
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

 Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
      (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
  1   0.08     3.40      0.350       (  0.225)       0.175        0.175
  2   0.17     4.70      0.484          0.225    (  0.242)        0.259
  3   0.25     4.70      0.484          0.225    (  0.242)        0.259
  4   0.33     5.10      0.525          0.225    (  0.263)        0.301
  5   0.42     5.80      0.597          0.225    (  0.299)        0.373
  6   0.50     5.90      0.608          0.225    (  0.304)        0.383
  7   0.58     7.10      0.731          0.225    (  0.366)        0.506
  8   0.67     8.70      0.896          0.225    (  0.448)        0.671
  9   0.75    13.20      1.359          0.225    (  0.680)        1.135
 10   0.83    29.70      3.058          0.225    (  1.529)        2.834
 11   0.92     7.70      0.793          0.225    (  0.396)        0.568
 12   1.00     4.00      0.412       (  0.225)       0.206        0.206
               (Loss Rate Not Used)
    Sum =     100.0                                  Sum =     7.7
      Flood volume = Effective rainfall      0.64(In)
       times area      55.8(Ac.)/[(In)/(Ft.)] =       3.0(Ac.Ft)
      Total soil loss =      0.22(In)
      Total soil loss =     1.019(Ac.Ft)
      Total rainfall =      0.86(In)
      Flood volume =      129559.1 Cubic Feet
      Total soil loss =       44381.4 Cubic Feet
      ------------------------------------------------------------------
       Peak flow rate of this hydrograph =     98.404(CFS)
      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          1 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
      ------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

      ------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       25.0      50.0      75.0     100.0
```


0+ 5 0.0133 1.94
0+10 0.0661 7.65
0+15 0.1451 11.47
0+20 0.2370 13.35
0+25 0.3471 15.99
0+30 0.4771 18.87
0+35 0.6256 21.58
0+40 0.8147 27.45
0+45 1.0797 38.48
0+50 1.5758 72.03
0+55 2.2535 98.40
1+ 0 2.5957 49.69
1+ 5 2.7741 25.91
1+10 2.8629 12.88
1+15 2.9154 7.63
1+20 2.9475 4.66
1+25 2.9687 3.08
1+30 2.9731 0.64
1+35 2.9743 0.17

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRD010310.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	0.85	47.46

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	2.00	111.68

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 1.323(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.323(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
65.7	65.7	0.408	0.500	0.225	1.000	0.225
					Sum (F) =	0.225

Area averaged mean soil loss (F) (In/Hr) = 0.225
Minimum soil loss rate ((In/Hr)) = 0.112
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	101.508	19.663	11.066
2	0.167	203.015	48.509	27.299
3	0.250	304.523	15.411	8.673
4	0.333	406.031	6.983	3.930
5	0.417	507.539	3.915	2.203
6	0.500	609.046	2.530	1.424
7	0.583	710.554	1.553	0.874
8	0.667	812.062	1.435	0.808
			Sum = 100.000	Sum= 56.276

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.206	(0.225)	0.103	0.103
2	0.17	1.30	0.206	(0.225)	0.103	0.103
3	0.25	1.10	0.175	(0.225)	0.087	0.087
4	0.33	1.50	0.238	(0.225)	0.119	0.119
5	0.42	1.50	0.238	(0.225)	0.119	0.119
6	0.50	1.80	0.286	(0.225)	0.143	0.143
7	0.58	1.50	0.238	(0.225)	0.119	0.119
8	0.67	1.80	0.286	(0.225)	0.143	0.143
9	0.75	1.80	0.286	(0.225)	0.143	0.143
10	0.83	1.50	0.238	(0.225)	0.119	0.119
11	0.92	1.60	0.254	(0.225)	0.127	0.127
12	1.00	1.80	0.286	(0.225)	0.143	0.143
13	1.08	2.20	0.349	(0.225)	0.175	0.175
14	1.17	2.20	0.349	(0.225)	0.175	0.175
15	1.25	2.20	0.349	(0.225)	0.175	0.175
16	1.33	2.00	0.317	(0.225)	0.159	0.159
17	1.42	2.60	0.413	(0.225)	0.206	0.206
18	1.50	2.70	0.429	(0.225)	0.214	0.214
19	1.58	2.40	0.381	(0.225)	0.190	0.190
20	1.67	2.70	0.429	(0.225)	0.214	0.214
21	1.75	3.30	0.524	0.225	(0.262)	0.299
22	1.83	3.10	0.492	0.225	(0.246)	0.267
23	1.92	2.90	0.460	0.225	(0.230)	0.236
24	2.00	3.00	0.476	0.225	(0.238)	0.252
25	2.08	3.10	0.492	0.225	(0.246)	0.267
26	2.17	4.20	0.667	0.225	(0.333)	0.442
27	2.25	5.00	0.794	0.225	(0.397)	0.569
28	2.33	3.50	0.556	0.225	(0.278)	0.331
29	2.42	6.80	1.079	0.225	(0.540)	0.855
30	2.50	7.30	1.159	0.225	(0.579)	0.934
31	2.58	8.20	1.302	0.225	(0.651)	1.077
32	2.67	5.90	0.937	0.225	(0.468)	0.712
33	2.75	2.00	0.317	(0.225)	0.159	0.159
34	2.83	1.80	0.286	(0.225)	0.143	0.143

```
35   2.92     1.80      0.286       (  0.225)       0.143        0.143
36   3.00     0.60      0.095       (  0.225)       0.048        0.048
             (Loss Rate Not Used)
   Sum =     100.0                                  Sum =     9.7
      Flood volume = Effective rainfall      0.81(In)
       times area      55.8(Ac.)/[(In)/(Ft.)] =       3.8(Ac.Ft)
      Total soil loss =      0.51(In)
      Total soil loss =     2.390(Ac.Ft)
      Total rainfall =      1.32(In)
      Flood volume =      164008.6 Cubic Feet
      Total soil loss =      104121.1 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     50.907(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
  Time(h+m) Volume Ac.Ft   Q(CFS)  0       15.0      30.0      45.0      60.0
  ------------------------------------------------------------------------
    0+ 5       0.0079      1.14  Q         |         |         |         |
    0+10       0.0351      3.96  V Q       |         |         |         |
    0+15       0.0674      4.68  V  Q      |         |         |         |
    0+20       0.1018      5.00  |V Q      |         |         |         |
    0+25       0.1429      5.96  |V Q      |         |         |         |
    0+30       0.1882      6.58  |V  Q     |         |         |         |
    0+35       0.2375      7.15  | V Q     |         |         |         |
    0+40       0.2864      7.10  |  VQ     |         |         |         |
    0+45       0.3392      7.67  |  V Q    |         |         |         |
    0+50       0.3915      7.59  |   VQ    |         |         |         |
    0+55       0.4405      7.13  |   Q     |         |         |         |
    1+ 0       0.4912      7.35  |   QV    |         |         |         |
    1+ 5       0.5472      8.14  |    Q    |         |         |         |
    1+10       0.6101      9.13  |     Q   |         |         |         |
    1+15       0.6753      9.47  |     QV  |         |         |         |
    1+20       0.7404      9.44  |     QV  |         |         |         |
    1+25       0.8066      9.62  |     Q V |         |         |         |
    1+30       0.8819     10.93  |      Q V|         |         |         |
    1+35       0.9596     11.28  |      Q  V         |         |         |
    1+40       1.0363     11.14  |      Q  |V        |         |         |
    1+45       1.1233     12.64  |       Q |V        |         |         |
    1+50       1.2252     14.79  |        Q|  V      |         |         |
    1+55       1.3242     14.39  |        Q|   V     |         |         |
    2+ 0       1.4194     13.82  |        Q|    V    |         |         |
    2+ 5       1.5174     14.23  |        Q|     V   |         |         |
    2+10       1.6322     16.67  |         |Q     V  |         |         |
    2+15       1.7907     23.02  |         |    Q   V|         |         |
    2+20       1.9661     25.46  |         |     Q   V         |         |
    2+25       2.1489     26.55  |         |      Q  | V       |         |
    2+30       2.4283     40.56  |         |         |    V Q  |         |
    2+35       2.7621     48.48  |         |         |         V| Q       |
    2+40       3.1127     50.91  |         |         |          | Q      |
    2+45       3.3705     37.43  |         |         |   Q      |    V   |
    2+50       3.5107     20.36  |         |  Q      |          |      V |
    2+55       3.6097     14.38  |       Q |         |          |       V|
    3+ 0       3.6848     10.90  |      Q  |         |          |        V|
    3+ 5       3.7273      6.16  |   Q     |         |          |        V|
    3+10       3.7480      3.01  | Q       |         |          |        V|
    3+15       3.7578      1.42  Q         |         |          |        V|
    3+20       3.7617      0.56  Q         |         |          |        V|
    3+25       3.7638      0.31  Q         |         |          |        V|
    3+30       3.7649      0.16  Q         |         |          |        V|
    3+35       3.7651      0.04  Q         |         |          |         V
------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRD010610.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	1.20	67.01

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	3.00	167.52

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 1.941(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 1.940(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
65.7	65.7	0.408	0.500	0.225	1.000	0.225
					Sum (F) =	0.225

Area averaged mean soil loss (F) (In/Hr) = 0.225
Minimum soil loss rate ((In/Hr)) = 0.112
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

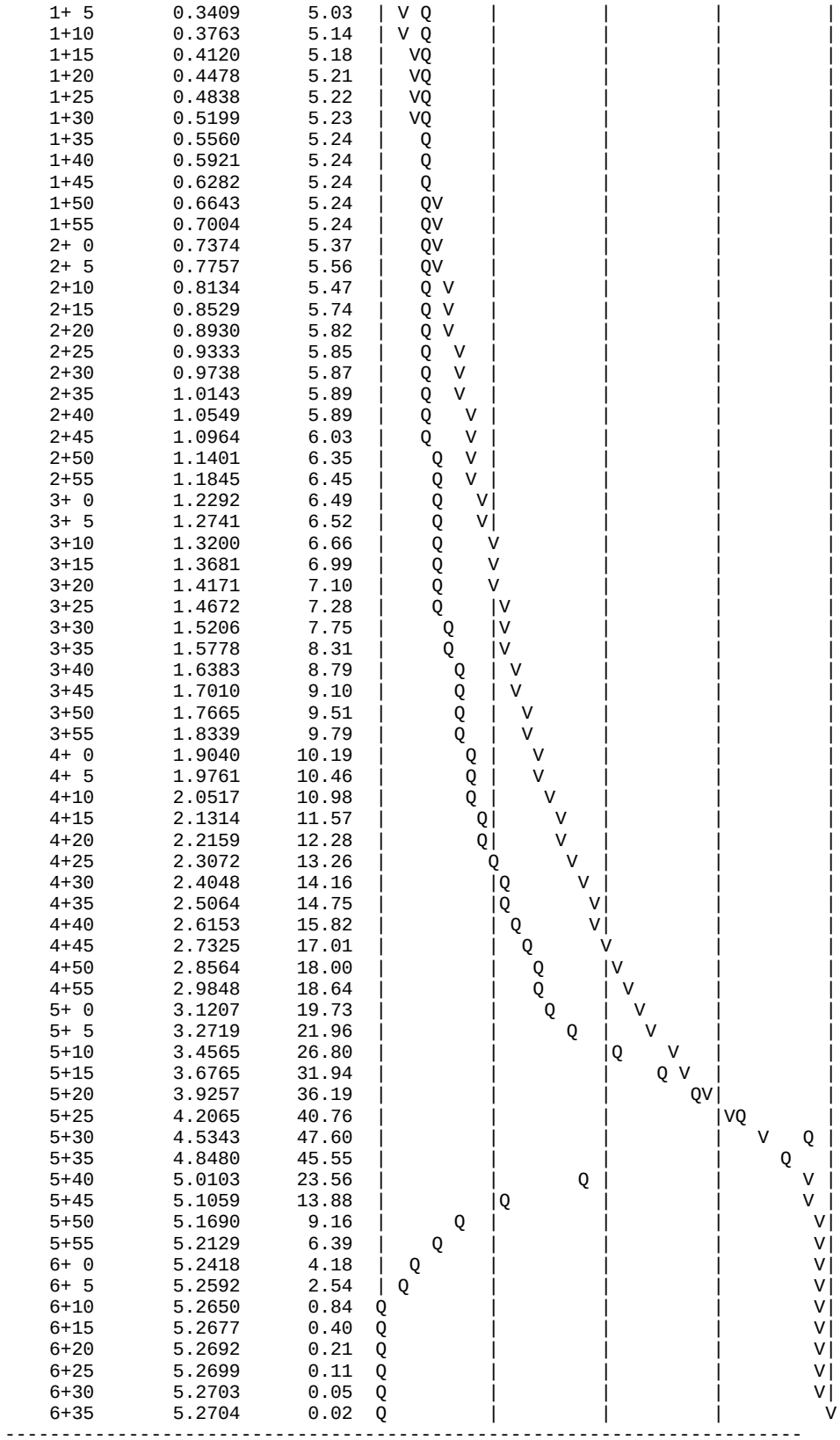
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	101.508	19.663	11.066
2	0.167	203.015	48.509	27.299
3	0.250	304.523	15.411	8.673
4	0.333	406.031	6.983	3.930
5	0.417	507.539	3.915	2.203
6	0.500	609.046	2.530	1.424
7	0.583	710.554	1.553	0.874
8	0.667	812.062	1.435	0.808
			Sum = 100.000	Sum= 56.276

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.116	(0.225)		0.058	0.058
2	0.17	0.60	0.140	(0.225)		0.070	0.070
3	0.25	0.60	0.140	(0.225)		0.070	0.070
4	0.33	0.60	0.140	(0.225)		0.070	0.070
5	0.42	0.60	0.140	(0.225)		0.070	0.070
6	0.50	0.70	0.163	(0.225)		0.081	0.081
7	0.58	0.70	0.163	(0.225)		0.081	0.081
8	0.67	0.70	0.163	(0.225)		0.081	0.081
9	0.75	0.70	0.163	(0.225)		0.081	0.081
10	0.83	0.70	0.163	(0.225)		0.081	0.081
11	0.92	0.70	0.163	(0.225)		0.081	0.081
12	1.00	0.80	0.186	(0.225)		0.093	0.093
13	1.08	0.80	0.186	(0.225)		0.093	0.093
14	1.17	0.80	0.186	(0.225)		0.093	0.093
15	1.25	0.80	0.186	(0.225)		0.093	0.093
16	1.33	0.80	0.186	(0.225)		0.093	0.093
17	1.42	0.80	0.186	(0.225)		0.093	0.093
18	1.50	0.80	0.186	(0.225)		0.093	0.093
19	1.58	0.80	0.186	(0.225)		0.093	0.093
20	1.67	0.80	0.186	(0.225)		0.093	0.093
21	1.75	0.80	0.186	(0.225)		0.093	0.093
22	1.83	0.80	0.186	(0.225)		0.093	0.093
23	1.92	0.80	0.186	(0.225)		0.093	0.093
24	2.00	0.90	0.210	(0.225)		0.105	0.105
25	2.08	0.80	0.186	(0.225)		0.093	0.093
26	2.17	0.90	0.210	(0.225)		0.105	0.105
27	2.25	0.90	0.210	(0.225)		0.105	0.105
28	2.33	0.90	0.210	(0.225)		0.105	0.105
29	2.42	0.90	0.210	(0.225)		0.105	0.105
30	2.50	0.90	0.210	(0.225)		0.105	0.105
31	2.58	0.90	0.210	(0.225)		0.105	0.105
32	2.67	0.90	0.210	(0.225)		0.105	0.105
33	2.75	1.00	0.233	(0.225)		0.116	0.116
34	2.83	1.00	0.233	(0.225)		0.116	0.116

```
35   2.92     1.00      0.233       (  0.225)       0.116        0.116
36   3.00     1.00      0.233       (  0.225)       0.116        0.116
37   3.08     1.00      0.233       (  0.225)       0.116        0.116
38   3.17     1.10      0.256       (  0.225)       0.128        0.128
39   3.25     1.10      0.256       (  0.225)       0.128        0.128
40   3.33     1.10      0.256       (  0.225)       0.128        0.128
41   3.42     1.20      0.279       (  0.225)       0.140        0.140
42   3.50     1.30      0.303       (  0.225)       0.151        0.151
43   3.58     1.40      0.326       (  0.225)       0.163        0.163
44   3.67     1.40      0.326       (  0.225)       0.163        0.163
45   3.75     1.50      0.349       (  0.225)       0.175        0.175
46   3.83     1.50      0.349       (  0.225)       0.175        0.175
47   3.92     1.60      0.373       (  0.225)       0.186        0.186
48   4.00     1.60      0.373       (  0.225)       0.186        0.186
49   4.08     1.70      0.396       (  0.225)       0.198        0.198
50   4.17     1.80      0.419       (  0.225)       0.210        0.210
51   4.25     1.90      0.442       (  0.225)       0.221        0.221
52   4.33     2.00      0.466          0.225    (  0.233)       0.241
53   4.42     2.10      0.489          0.225    (  0.244)       0.264
54   4.50     2.10      0.489          0.225    (  0.244)       0.264
55   4.58     2.20      0.512          0.225    (  0.256)       0.288
56   4.67     2.30      0.535          0.225    (  0.268)       0.311
57   4.75     2.40      0.559          0.225    (  0.279)       0.334
58   4.83     2.40      0.559          0.225    (  0.279)       0.334
59   4.92     2.50      0.582          0.225    (  0.291)       0.357
60   5.00     2.60      0.605          0.225    (  0.303)       0.381
61   5.08     3.10      0.722          0.225    (  0.361)       0.497
62   5.17     3.60      0.838          0.225    (  0.419)       0.614
63   5.25     3.90      0.908          0.225    (  0.454)       0.683
64   5.33     4.20      0.978          0.225    (  0.489)       0.753
65   5.42     4.70      1.094          0.225    (  0.547)       0.870
66   5.50     5.60      1.304          0.225    (  0.652)       1.079
67   5.58     1.90      0.442       (  0.225)       0.221        0.221
68   5.67     0.90      0.210       (  0.225)       0.105        0.105
69   5.75     0.60      0.140       (  0.225)       0.070        0.070
70   5.83     0.50      0.116       (  0.225)       0.058        0.058
71   5.92     0.30      0.070       (  0.225)       0.035        0.035
72   6.00     0.20      0.047       (  0.225)       0.023        0.023
            (Loss Rate Not Used)
   Sum =     100.0                                   Sum =    13.6
     Flood volume = Effective rainfall      1.13(In)
      times area      55.8(Ac.)/[(In)/(Ft.)] =       5.3(Ac.Ft)
     Total soil loss =      0.81(In)
     Total soil loss =     3.758(Ac.Ft)
     Total rainfall =      1.94(In)
     Flood volume =      229578.2 Cubic Feet
     Total soil loss =      163691.1 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =     47.605(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         6 - H O U R    S T O R M
                    R u n o f f     H y d r o g r a p h
     ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
-------------------------------------------------------------------------
  0+ 5       0.0044      0.64  Q         |         |         |         |
  0+10       0.0207      2.36  VQ        |         |         |         |
  0+15       0.0427      3.19  V Q       |         |         |         |
  0+20       0.0669      3.52  V Q       |         |         |         |
  0+25       0.0923      3.69  V Q       |         |         |         |
  0+30       0.1193      3.93  V  Q      |         |         |         |
  0+35       0.1490      4.31  |V Q      |         |         |         |
  0+40       0.1798      4.47  |V Q      |         |         |         |
  0+45       0.2110      4.53  |V Q      |         |         |         |
  0+50       0.2424      4.55  |V Q      |         |         |         |
  0+55       0.2738      4.57  | VQ      |         |         |         |
  1+ 0       0.3062      4.71  | VQ      |         |         |         |
```



U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: PRD0102410.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 10 YEAR HOUR STORM
HUNSAKER & ASSOCIATES, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	2.00	111.68

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	5.00	279.20

STORM EVENT (YEAR) = 10.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 3.234(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 3.234(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
65.7	65.7	0.408	0.500	0.225	1.000	0.225
					Sum (F) =	0.225

Area averaged mean soil loss (F) (In/Hr) = 0.225
Minimum soil loss rate ((In/Hr)) = 0.112
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	304.523	57.140	32.156
2	0.500	609.046	36.881	20.755
3	0.750	913.570	5.980	3.365
			Sum = 100.000	Sum= 56.276

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.026	(0.397)	0.013	0.013
2	0.50	0.30	0.039	(0.392)	0.019	0.019
3	0.75	0.30	0.039	(0.388)	0.019	0.019
4	1.00	0.40	0.052	(0.383)	0.026	0.026
5	1.25	0.30	0.039	(0.378)	0.019	0.019
6	1.50	0.30	0.039	(0.374)	0.019	0.019
7	1.75	0.30	0.039	(0.369)	0.019	0.019
8	2.00	0.40	0.052	(0.365)	0.026	0.026
9	2.25	0.40	0.052	(0.361)	0.026	0.026
10	2.50	0.40	0.052	(0.356)	0.026	0.026
11	2.75	0.50	0.065	(0.352)	0.032	0.032
12	3.00	0.50	0.065	(0.348)	0.032	0.032
13	3.25	0.50	0.065	(0.343)	0.032	0.032
14	3.50	0.50	0.065	(0.339)	0.032	0.032
15	3.75	0.50	0.065	(0.335)	0.032	0.032
16	4.00	0.60	0.078	(0.331)	0.039	0.039
17	4.25	0.60	0.078	(0.326)	0.039	0.039
18	4.50	0.70	0.091	(0.322)	0.045	0.045
19	4.75	0.70	0.091	(0.318)	0.045	0.045
20	5.00	0.80	0.103	(0.314)	0.052	0.052
21	5.25	0.60	0.078	(0.310)	0.039	0.039
22	5.50	0.70	0.091	(0.306)	0.045	0.045
23	5.75	0.80	0.103	(0.302)	0.052	0.052
24	6.00	0.80	0.103	(0.298)	0.052	0.052
25	6.25	0.90	0.116	(0.294)	0.058	0.058
26	6.50	0.90	0.116	(0.290)	0.058	0.058
27	6.75	1.00	0.129	(0.286)	0.065	0.065
28	7.00	1.00	0.129	(0.282)	0.065	0.065
29	7.25	1.00	0.129	(0.278)	0.065	0.065
30	7.50	1.10	0.142	(0.275)	0.071	0.071
31	7.75	1.20	0.155	(0.271)	0.078	0.078
32	8.00	1.30	0.168	(0.267)	0.084	0.084
33	8.25	1.50	0.194	(0.263)	0.097	0.097
34	8.50	1.50	0.194	(0.260)	0.097	0.097
35	8.75	1.60	0.207	(0.256)	0.103	0.103
36	9.00	1.70	0.220	(0.252)	0.110	0.110
37	9.25	1.90	0.246	(0.249)	0.123	0.123
38	9.50	2.00	0.259	(0.245)	0.129	0.129
39	9.75	2.10	0.272	(0.242)	0.136	0.136

```
40  10.00     2.20      0.285       (  0.238)       0.142        0.142
41  10.25     1.50      0.194       (  0.235)       0.097        0.097
42  10.50     1.50      0.194       (  0.232)       0.097        0.097
43  10.75     2.00      0.259       (  0.228)       0.129        0.129
44  11.00     2.00      0.259       (  0.225)       0.129        0.129
45  11.25     1.90      0.246       (  0.222)       0.123        0.123
46  11.50     1.90      0.246       (  0.218)       0.123        0.123
47  11.75     1.70      0.220       (  0.215)       0.110        0.110
48  12.00     1.80      0.233       (  0.212)       0.116        0.116
49  12.25     2.50      0.323       (  0.209)       0.162        0.162
50  12.50     2.60      0.336       (  0.206)       0.168        0.168
51  12.75     2.80      0.362       (  0.202)       0.181        0.181
52  13.00     2.90      0.375       (  0.199)       0.188        0.188
53  13.25     3.40      0.440          0.196    (  0.220)       0.243
54  13.50     3.40      0.440          0.193    (  0.220)       0.246
55  13.75     2.30      0.298       (  0.190)       0.149        0.149
56  14.00     2.30      0.298       (  0.188)       0.149        0.149
57  14.25     2.70      0.349       (  0.185)       0.175        0.175
58  14.50     2.60      0.336       (  0.182)       0.168        0.168
59  14.75     2.60      0.336       (  0.179)       0.168        0.168
60  15.00     2.50      0.323       (  0.176)       0.162        0.162
61  15.25     2.40      0.310       (  0.174)       0.155        0.155
62  15.50     2.30      0.298       (  0.171)       0.149        0.149
63  15.75     1.90      0.246       (  0.168)       0.123        0.123
64  16.00     1.90      0.246       (  0.166)       0.123        0.123
65  16.25     0.40      0.052       (  0.163)       0.026        0.026
66  16.50     0.40      0.052       (  0.161)       0.026        0.026
67  16.75     0.30      0.039       (  0.158)       0.019        0.019
68  17.00     0.30      0.039       (  0.156)       0.019        0.019
69  17.25     0.50      0.065       (  0.154)       0.032        0.032
70  17.50     0.50      0.065       (  0.151)       0.032        0.032
71  17.75     0.50      0.065       (  0.149)       0.032        0.032
72  18.00     0.40      0.052       (  0.147)       0.026        0.026
73  18.25     0.40      0.052       (  0.145)       0.026        0.026
74  18.50     0.40      0.052       (  0.143)       0.026        0.026
75  18.75     0.30      0.039       (  0.141)       0.019        0.019
76  19.00     0.20      0.026       (  0.139)       0.013        0.013
77  19.25     0.30      0.039       (  0.137)       0.019        0.019
78  19.50     0.40      0.052       (  0.135)       0.026        0.026
79  19.75     0.30      0.039       (  0.133)       0.019        0.019
80  20.00     0.20      0.026       (  0.131)       0.013        0.013
81  20.25     0.30      0.039       (  0.129)       0.019        0.019
82  20.50     0.30      0.039       (  0.128)       0.019        0.019
83  20.75     0.30      0.039       (  0.126)       0.019        0.019
84  21.00     0.20      0.026       (  0.124)       0.013        0.013
85  21.25     0.30      0.039       (  0.123)       0.019        0.019
86  21.50     0.20      0.026       (  0.122)       0.013        0.013
87  21.75     0.30      0.039       (  0.120)       0.019        0.019
88  22.00     0.20      0.026       (  0.119)       0.013        0.013
89  22.25     0.30      0.039       (  0.118)       0.019        0.019
90  22.50     0.20      0.026       (  0.117)       0.013        0.013
91  22.75     0.20      0.026       (  0.116)       0.013        0.013
92  23.00     0.20      0.026       (  0.115)       0.013        0.013
93  23.25     0.20      0.026       (  0.114)       0.013        0.013
94  23.50     0.20      0.026       (  0.113)       0.013        0.013
95  23.75     0.20      0.026       (  0.113)       0.013        0.013
96  24.00     0.20      0.026       (  0.112)       0.013        0.013
              (Loss Rate Not Used)
   Sum =     100.0                                    Sum =     6.5
     Flood volume = Effective rainfall      1.63(In)
      times area      55.8(Ac.)/[(In)/(Ft.)] =       7.6(Ac.Ft)
     Total soil loss =      1.60(In)
     Total soil loss =     7.466(Ac.Ft)
     Total rainfall =      3.23(In)
     Flood volume =      330287.5 Cubic Feet
     Total soil loss =      325215.7 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =     13.614(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         24 - H O U R    S T O R M
```

R u n o f f H y d r o g r a p h

Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 5.0 10.0 15.0 20.0
0+15	0.0086	0.42	Q
0+30	0.0270	0.89	VQ
0+45	0.0492	1.07	V Q
1+ 0	0.0760	1.30	V Q
1+15	0.1014	1.23	V Q
1+30	0.1244	1.11	V Q
1+45	0.1470	1.09	V Q
2+ 0	0.1739	1.30	V Q
2+15	0.2035	1.43	VQ
2+30	0.2336	1.46	VQ
2+45	0.2680	1.66	V Q
3+ 0	0.3052	1.80	V Q
3+15	0.3428	1.82	V Q
3+30	0.3804	1.82	VQ
3+45	0.4180	1.82	VQ
4+ 0	0.4599	2.03	V Q
4+15	0.5046	2.16	V Q
4+30	0.5541	2.39	V Q
4+45	0.6063	2.53	V Q
5+ 0	0.6633	2.76	V Q
5+15	0.7144	2.48	VQ
5+30	0.7648	2.44	Q
5+45	0.8213	2.74	VQ
6+ 0	0.8810	2.89	VQ
6+15	0.9455	3.12	V Q
6+30	1.0128	3.26	VQ
6+45	1.0848	3.49	VQ
7+ 0	1.1596	3.62	VQ
7+15	1.2348	3.64	VQ
7+30	1.3144	3.85	VQ
7+45	1.4010	4.19	VQ
8+ 0	1.4951	4.56	V Q
8+15	1.6011	5.13	V Q
8+30	1.7131	5.42	VQ
8+45	1.8302	5.67	V|Q
9+ 0	1.9544	6.01	V Q
9+15	2.0905	6.59	V Q
9+30	2.2369	7.08	V Q
9+45	2.3912	7.47	V Q
10+ 0	2.5531	7.83	V Q
10+15	2.6880	6.53	QV
10+30	2.8041	5.61	Q V
10+45	2.9384	6.50	Q V
11+ 0	3.0866	7.17	Q V
11+15	3.2328	7.08	Q V
11+30	3.3762	6.94	Q V
11+45	3.5106	6.50	Q V
12+ 0	3.6437	6.44	Q V
12+15	3.8088	7.99	Q V
12+30	3.9980	9.16	Q V
12+45	4.2018	9.86	Q V
13+ 0	4.4159	10.36	Q V
13+15	4.6708	12.34	Q
13+30	4.9521	13.61	VQ
13+45	5.1736	10.72	Q V
14+ 0	5.3535	8.70	Q V
14+15	5.5437	9.21	Q V
14+30	5.7408	9.54	Q V
14+45	5.9368	9.49	Q V
15+ 0	6.1282	9.26	Q V
15+15	6.3124	8.92	Q V
15+30	6.4892	8.55	Q V
15+45	6.6455	7.57	Q V
16+ 0	6.7902	7.01	Q V

```
   16+15       6.8687      3.80  |       Q  |          |          |      V   |
   16+30       6.9055      1.78  |   Q      |          |          |      V   |
   16+45       6.9313      1.25  |  Q       |          |          |      V   |
   17+ 0       6.9544      1.11  |  Q       |          |          |      V   |
   17+15       6.9855      1.51  |   Q      |          |          |      V   |
   17+30       7.0222      1.78  |   Q      |          |          |       V  |
   17+45       7.0599      1.82  |   Q      |          |          |       V  |
   18+ 0       7.0932      1.61  |   Q      |          |          |       V  |
   18+15       7.1237      1.48  |  Q       |          |          |       V  |
   18+30       7.1538      1.46  |  Q       |          |          |       V  |
   18+45       7.1796      1.25  |  Q       |          |          |       V  |
   19+ 0       7.1984      0.91  |Q         |          |          |       V  |
   19+15       7.2181      0.96  |Q         |          |          |        V |
   19+30       7.2446      1.28  |  Q       |          |          |        V |
   19+45       7.2699      1.23  |  Q       |          |          |        V |
   20+ 0       7.2886      0.91  |Q         |          |          |        V |
   20+15       7.3084      0.96  |Q         |          |          |        V |
   20+30       7.3306      1.07  |  Q       |          |          |        V |
   20+45       7.3531      1.09  |  Q       |          |          |        V |
   21+ 0       7.3714      0.88  |Q         |          |          |        V |
   21+15       7.3912      0.96  |Q         |          |          |        V |
   21+30       7.4090      0.86  |Q         |          |          |         V|
   21+45       7.4288      0.96  |Q         |          |          |         V|
   22+ 0       7.4466      0.86  |Q         |          |          |         V|
   22+15       7.4664      0.96  |Q         |          |          |         V|
   22+30       7.4843      0.86  |Q         |          |          |         V|
   22+45       7.4998      0.75  |Q         |          |          |         V|
   23+ 0       7.5148      0.73  |Q         |          |          |         V|
   23+15       7.5299      0.73  |Q         |          |          |         V|
   23+30       7.5449      0.73  |Q         |          |          |         V|
   23+45       7.5600      0.73  |Q         |          |          |         V|
   24+ 0       7.5750      0.73  |Q         |          |          |         V|
   24+15       7.5815      0.31  Q          |          |          |         V|
   24+30       7.5824      0.04  Q          |          |          |          V
-------------------------------------------------------------------------------
```

- Area 'D' – 100 Year - Post-Development Condition – Unit Hydrograph

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRD1001100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR 1 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	0.55	30.71

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	1.30	72.59

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.300(In)

Point rain (area averaged) = 1.300(In)
Areal adjustment factor = 99.95 %
Adjusted average point rain = 1.299(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

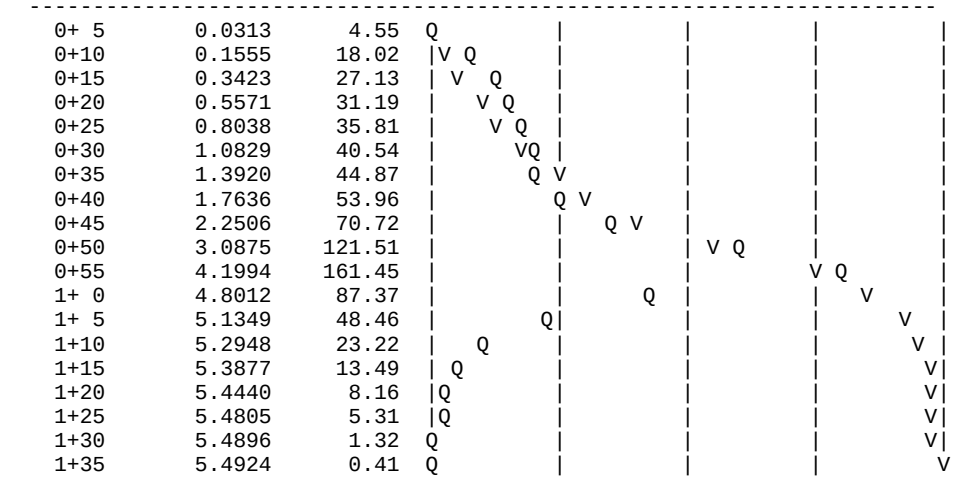
```
RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-3     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
65.7  82.4      0.216     0.500        0.119       1.000      0.119
                                                 Sum (F) =   0.119
Area averaged mean soil loss (F) (In/Hr) =  0.119
Minimum soil loss rate ((In/Hr)) =  0.060
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5300
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                      VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083        101.508         19.663             11.066
    2   0.167        203.015         48.509             27.299
    3   0.250        304.523         15.411              8.673
    4   0.333        406.031          6.983              3.930
    5   0.417        507.539          3.915              2.203
    6   0.500        609.046          2.530              1.424
    7   0.583        710.554          1.553              0.874
    8   0.667        812.062          1.435              0.808
                              Sum = 100.000   Sum=      56.276
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

 Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
      (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
  1   0.08     3.40      0.530          0.119    (  0.265)        0.411
  2   0.17     4.70      0.733          0.119    (  0.366)        0.614
  3   0.25     4.70      0.733          0.119    (  0.366)        0.614
  4   0.33     5.10      0.795          0.119    (  0.398)        0.676
  5   0.42     5.80      0.904          0.119    (  0.452)        0.785
  6   0.50     5.90      0.920          0.119    (  0.460)        0.801
  7   0.58     7.10      1.107          0.119    (  0.554)        0.988
  8   0.67     8.70      1.357          0.119    (  0.678)        1.237
  9   0.75    13.20      2.058          0.119    (  1.029)        1.939
 10   0.83    29.70      4.631          0.119    (  2.315)        4.512
 11   0.92     7.70      1.201          0.119    (  0.600)        1.082
 12   1.00     4.00      0.624          0.119    (  0.312)        0.505
              (Loss Rate Not Used)
    Sum =     100.0                                  Sum =    14.2
      Flood volume = Effective rainfall      1.18(In)
       times area      55.8(Ac.)/[(In)/(Ft.)] =       5.5(Ac.Ft)
      Total soil loss =      0.12(In)
      Total soil loss =     0.554(Ac.Ft)
      Total rainfall =      1.30(In)
      Flood volume =      239249.0 Cubic Feet
      Total soil loss =       24126.6 Cubic Feet
      ------------------------------------------------------------------
       Peak flow rate of this hydrograph =    161.451(CFS)
      ------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         1 - H O U R    S T O R M
                      R u n o f f      H y d r o g r a p h
      ------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

      ------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
```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0+10 0.1555 18.02
0+15 0.3423 27.13
0+20 0.5571 31.19
0+25 0.8038 35.81
0+30 1.0829 40.54
0+35 1.3920 44.87
0+40 1.7636 53.96
0+45 2.2506 70.72
0+50 3.0875 121.51
0+55 4.1994 161.45
1+ 0 4.8012 87.37
1+ 5 5.1349 48.46
1+10 5.2948 23.22
1+15 5.3877 13.49
1+20 5.4440 8.16
1+25 5.4805 5.31
1+30 5.4896 1.32
1+35 5.4924 0.41

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRD1003100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR 3 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	0.85	47.46

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	2.00	111.68

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.850(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 2.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
65.7	82.4	0.216	0.500	0.119	1.000	0.119
					Sum (F) =	0.119

Area averaged mean soil loss (F) (In/Hr) = 0.119
Minimum soil loss rate ((In/Hr)) = 0.060
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	101.508	19.663	11.066
2	0.167	203.015	48.509	27.299
3	0.250	304.523	15.411	8.673
4	0.333	406.031	6.983	3.930
5	0.417	507.539	3.915	2.203
6	0.500	609.046	2.530	1.424
7	0.583	710.554	1.553	0.874
8	0.667	812.062	1.435	0.808
			Sum = 100.000	Sum= 56.276

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.312	0.119	(0.156)	0.193
2	0.17	1.30	0.312	0.119	(0.156)	0.193
3	0.25	1.10	0.264	0.119	(0.132)	0.145
4	0.33	1.50	0.360	0.119	(0.180)	0.241
5	0.42	1.50	0.360	0.119	(0.180)	0.241
6	0.50	1.80	0.432	0.119	(0.216)	0.313
7	0.58	1.50	0.360	0.119	(0.180)	0.241
8	0.67	1.80	0.432	0.119	(0.216)	0.313
9	0.75	1.80	0.432	0.119	(0.216)	0.313
10	0.83	1.50	0.360	0.119	(0.180)	0.241
11	0.92	1.60	0.384	0.119	(0.192)	0.265
12	1.00	1.80	0.432	0.119	(0.216)	0.313
13	1.08	2.20	0.528	0.119	(0.264)	0.409
14	1.17	2.20	0.528	0.119	(0.264)	0.409
15	1.25	2.20	0.528	0.119	(0.264)	0.409
16	1.33	2.00	0.480	0.119	(0.240)	0.361
17	1.42	2.60	0.624	0.119	(0.312)	0.505
18	1.50	2.70	0.648	0.119	(0.324)	0.529
19	1.58	2.40	0.576	0.119	(0.288)	0.457
20	1.67	2.70	0.648	0.119	(0.324)	0.529
21	1.75	3.30	0.792	0.119	(0.396)	0.673
22	1.83	3.10	0.744	0.119	(0.372)	0.625
23	1.92	2.90	0.696	0.119	(0.348)	0.577
24	2.00	3.00	0.720	0.119	(0.360)	0.601
25	2.08	3.10	0.744	0.119	(0.372)	0.625
26	2.17	4.20	1.008	0.119	(0.504)	0.889
27	2.25	5.00	1.200	0.119	(0.600)	1.081
28	2.33	3.50	0.840	0.119	(0.420)	0.721
29	2.42	6.80	1.632	0.119	(0.816)	1.513
30	2.50	7.30	1.752	0.119	(0.876)	1.633
31	2.58	8.20	1.968	0.119	(0.984)	1.848
32	2.67	5.90	1.416	0.119	(0.708)	1.297
33	2.75	2.00	0.480	0.119	(0.240)	0.361
34	2.83	1.80	0.432	0.119	(0.216)	0.313

```
35   2.92     1.80      0.432          0.119    (  0.216)        0.313
36   3.00     0.60      0.144       (  0.119)       0.072        0.072
             (Loss Rate Not Used)
   Sum =     100.0                                  Sum =    19.8
      Flood volume = Effective rainfall      1.65(In)
       times area      55.8(Ac.)/[(In)/(Ft.)] =       7.7(Ac.Ft)
      Total soil loss =      0.35(In)
      Total soil loss =     1.643(Ac.Ft)
      Total rainfall =      2.00(In)
      Flood volume =      333714.2 Cubic Feet
      Total soil loss =       71585.1 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     89.368(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          3 - H O U R    S T O R M
                     R u n o f f      H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       22.5      45.0      67.5      90.0
---------------------------------------------------------------------------
  0+ 5       0.0147      2.14  Q         |         |         |         |
  0+10       0.0657      7.40  V  Q      |         |         |         |
  0+15       0.1246      8.55  V  Q      |         |         |         |
  0+20       0.1869      9.06  V   Q     |         |         |         |
  0+25       0.2674     11.69  |V   Q    |         |         |         |
  0+30       0.3597     13.40  |V   Q    |         |         |         |
  0+35       0.4631     15.01  | V   Q   |         |         |         |
  0+40       0.5648     14.77  | V   Q   |         |         |         |
  0+45       0.6784     16.49  |  V   Q  |         |         |         |
  0+50       0.7902     16.23  |   V  Q  |         |         |         |
  0+55       0.8924     14.84  |   V Q   |         |         |         |
  1+ 0       0.9993     15.52  |    VQ   |         |         |         |
  1+ 5       1.1227     17.92  |    V Q  |         |         |         |
  1+10       1.2666     20.89  |     V  Q|         |         |         |
  1+15       1.4176     21.92  |      V Q|         |         |         |
  1+20       1.5680     21.85  |       VQ|         |         |         |
  1+25       1.7221     22.37  |       VQ|         |         |         |
  1+30       1.9036     26.35  |        V|Q        |         |         |
  1+35       2.0923     27.39  |         V Q       |         |         |
  1+40       2.2780     26.97  |         |Q        |         |         |
  1+45       2.4864     30.25  |         | VQ      |         |         |
  1+50       2.7220     34.21  |         |   VQ    |         |         |
  1+55       2.9552     33.86  |         |    Q    |         |         |
  2+ 0       3.1836     33.16  |         |   Q V   |         |         |
  2+ 5       3.4167     33.85  |         |    Q V  |         |         |
  2+10       3.6753     37.55  |         |     Q  V|         |         |
  2+15       4.0004     47.20  |         |         Q         |         |
  2+20       4.3510     50.90  |         |         | Q       |         |
  2+25       4.7129     52.55  |         |         |  QV     |         |
  2+30       5.2206     73.73  |         |         |      V  | Q       |
  2+35       5.8108     85.69  |         |         |         V       Q |
  2+40       6.4263     89.37  |         |         |         |  V     Q|
  2+45       6.8939     67.89  |         |         |         Q    V    |
  2+50       7.1632     39.10  |         |         Q  |         |      V  |
  2+55       7.3597     28.54  |         | Q       |         |       V |
  3+ 0       7.5086     21.62  |         Q|        |         |        V|
  3+ 5       7.5877     11.49  |    Q    |         |         |        V|
  3+10       7.6269      5.69  | Q       |         |         |        V|
  3+15       7.6461      2.78  |Q        |         |         |        V|
  3+20       7.6541      1.17  Q         |         |         |        V|
  3+25       7.6584      0.63  Q         |         |         |        V|
  3+30       7.6606      0.32  Q         |         |         |        V|
  3+35       7.6610      0.06  Q         |         |         |        V|
---------------------------------------------------------------------------
```

U n i t H y d r o g r a p h A n a l y s i s

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Study date 05/18/21 File: PRD1006100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6407

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR 6 HOUR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	1.20	67.01

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	3.00	167.52

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.200(In)
Area Averaged 100-Year Rainfall = 3.000(In)

Point rain (area averaged) = 3.000(In)
Areal adjustment factor = 99.98 %
Adjusted average point rain = 2.999(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
65.7	82.4	0.216	0.500	0.119	1.000	0.119
					Sum (F) =	0.119

Area averaged mean soil loss (F) (In/Hr) = 0.119
Minimum soil loss rate ((In/Hr)) = 0.060
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

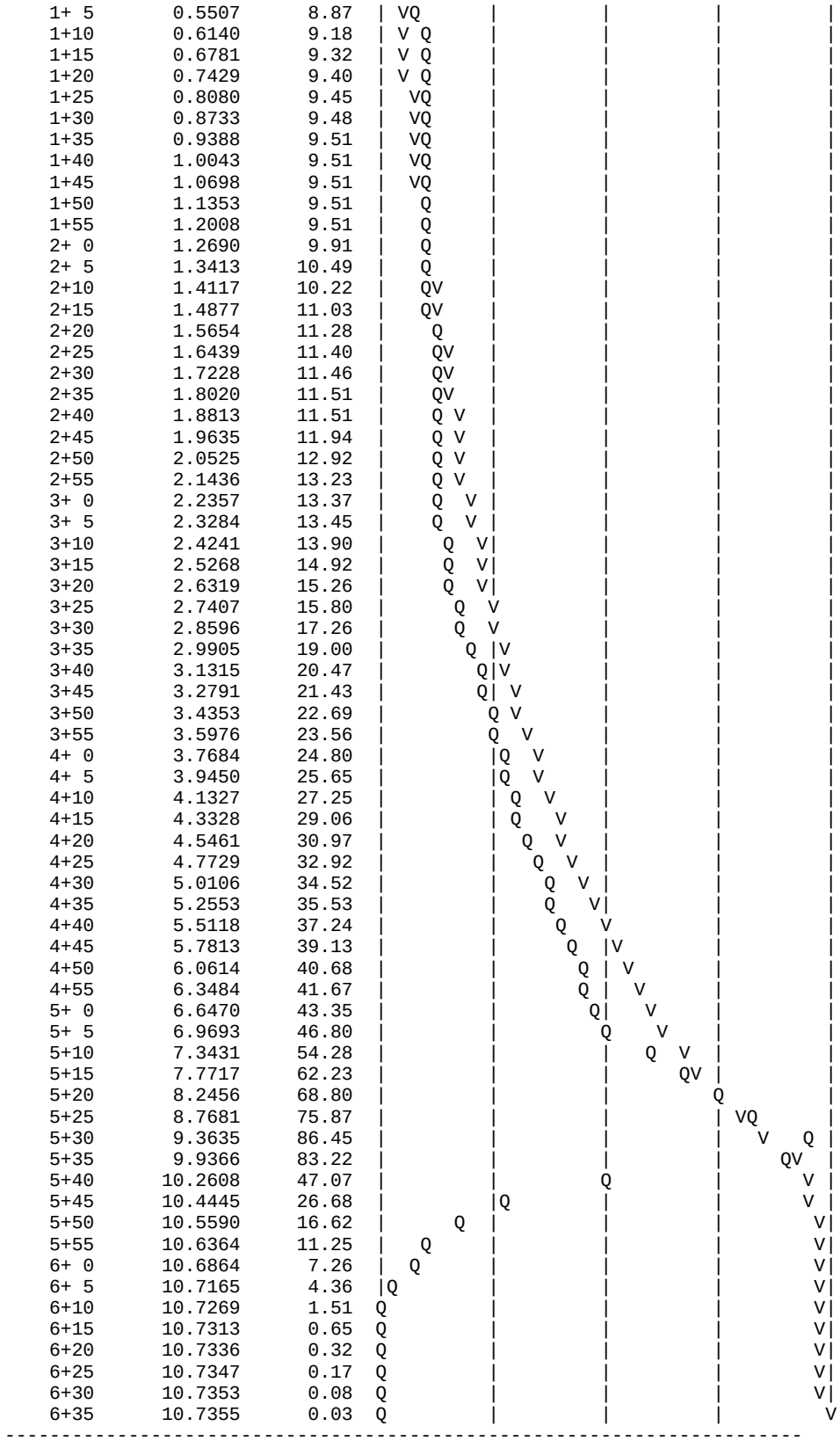
Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	101.508	19.663	11.066
2	0.167	203.015	48.509	27.299
3	0.250	304.523	15.411	8.673
4	0.333	406.031	6.983	3.930
5	0.417	507.539	3.915	2.203
6	0.500	609.046	2.530	1.424
7	0.583	710.554	1.553	0.874
8	0.667	812.062	1.435	0.808
			Sum = 100.000	Sum= 56.276

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.180	(0.119)		0.090	0.090
2	0.17	0.60	0.216	(0.119)		0.108	0.108
3	0.25	0.60	0.216	(0.119)		0.108	0.108
4	0.33	0.60	0.216	(0.119)		0.108	0.108
5	0.42	0.60	0.216	(0.119)		0.108	0.108
6	0.50	0.70	0.252	0.119	(	0.126)	0.133
7	0.58	0.70	0.252	0.119	(	0.126)	0.133
8	0.67	0.70	0.252	0.119	(	0.126)	0.133
9	0.75	0.70	0.252	0.119	(	0.126)	0.133
10	0.83	0.70	0.252	0.119	(	0.126)	0.133
11	0.92	0.70	0.252	0.119	(	0.126)	0.133
12	1.00	0.80	0.288	0.119	(	0.144)	0.169
13	1.08	0.80	0.288	0.119	(	0.144)	0.169
14	1.17	0.80	0.288	0.119	(	0.144)	0.169
15	1.25	0.80	0.288	0.119	(	0.144)	0.169
16	1.33	0.80	0.288	0.119	(	0.144)	0.169
17	1.42	0.80	0.288	0.119	(	0.144)	0.169
18	1.50	0.80	0.288	0.119	(	0.144)	0.169
19	1.58	0.80	0.288	0.119	(	0.144)	0.169
20	1.67	0.80	0.288	0.119	(	0.144)	0.169
21	1.75	0.80	0.288	0.119	(	0.144)	0.169
22	1.83	0.80	0.288	0.119	(	0.144)	0.169
23	1.92	0.80	0.288	0.119	(	0.144)	0.169
24	2.00	0.90	0.324	0.119	(	0.162)	0.205
25	2.08	0.80	0.288	0.119	(	0.144)	0.169
26	2.17	0.90	0.324	0.119	(	0.162)	0.205
27	2.25	0.90	0.324	0.119	(	0.162)	0.205
28	2.33	0.90	0.324	0.119	(	0.162)	0.205
29	2.42	0.90	0.324	0.119	(	0.162)	0.205
30	2.50	0.90	0.324	0.119	(	0.162)	0.205
31	2.58	0.90	0.324	0.119	(	0.162)	0.205
32	2.67	0.90	0.324	0.119	(	0.162)	0.205
33	2.75	1.00	0.360	0.119	(	0.180)	0.241
34	2.83	1.00	0.360	0.119	(	0.180)	0.241

```
35   2.92     1.00      0.360          0.119    (  0.180)        0.241
36   3.00     1.00      0.360          0.119    (  0.180)        0.241
37   3.08     1.00      0.360          0.119    (  0.180)        0.241
38   3.17     1.10      0.396          0.119    (  0.198)        0.277
39   3.25     1.10      0.396          0.119    (  0.198)        0.277
40   3.33     1.10      0.396          0.119    (  0.198)        0.277
41   3.42     1.20      0.432          0.119    (  0.216)        0.313
42   3.50     1.30      0.468          0.119    (  0.234)        0.349
43   3.58     1.40      0.504          0.119    (  0.252)        0.385
44   3.67     1.40      0.504          0.119    (  0.252)        0.385
45   3.75     1.50      0.540          0.119    (  0.270)        0.421
46   3.83     1.50      0.540          0.119    (  0.270)        0.421
47   3.92     1.60      0.576          0.119    (  0.288)        0.457
48   4.00     1.60      0.576          0.119    (  0.288)        0.457
49   4.08     1.70      0.612          0.119    (  0.306)        0.493
50   4.17     1.80      0.648          0.119    (  0.324)        0.529
51   4.25     1.90      0.684          0.119    (  0.342)        0.565
52   4.33     2.00      0.720          0.119    (  0.360)        0.601
53   4.42     2.10      0.756          0.119    (  0.378)        0.637
54   4.50     2.10      0.756          0.119    (  0.378)        0.637
55   4.58     2.20      0.792          0.119    (  0.396)        0.673
56   4.67     2.30      0.828          0.119    (  0.414)        0.709
57   4.75     2.40      0.864          0.119    (  0.432)        0.745
58   4.83     2.40      0.864          0.119    (  0.432)        0.745
59   4.92     2.50      0.900          0.119    (  0.450)        0.781
60   5.00     2.60      0.936          0.119    (  0.468)        0.817
61   5.08     3.10      1.116          0.119    (  0.558)        0.997
62   5.17     3.60      1.296          0.119    (  0.648)        1.177
63   5.25     3.90      1.404          0.119    (  0.702)        1.285
64   5.33     4.20      1.512          0.119    (  0.756)        1.393
65   5.42     4.70      1.692          0.119    (  0.846)        1.573
66   5.50     5.60      2.016          0.119    (  1.008)        1.897
67   5.58     1.90      0.684          0.119    (  0.342)        0.565
68   5.67     0.90      0.324          0.119    (  0.162)        0.205
69   5.75     0.60      0.216       (  0.119)       0.108        0.108
70   5.83     0.50      0.180       (  0.119)       0.090        0.090
71   5.92     0.30      0.108       (  0.119)       0.054        0.054
72   6.00     0.20      0.072       (  0.119)       0.036        0.036
            (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    27.7
      Flood volume = Effective rainfall      2.31(In)
       times area      55.8(Ac.)/[(In)/(Ft.)] =      10.7(Ac.Ft)
      Total soil loss =      0.69(In)
      Total soil loss =     3.222(Ac.Ft)
      Total rainfall =      3.00(In)
      Flood volume =      467636.7 Cubic Feet
      Total soil loss =      140344.2 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     86.447(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - H O U R    S T O R M
                     R u n o f f     H y d r o g r a p h
      ---------------------------------------------------------------------
                  Hydrograph in   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       22.5      45.0      67.5      90.0
-------------------------------------------------------------------------
  0+ 5       0.0069      1.00  Q         |         |         |         |
  0+10       0.0320      3.65  VQ        |         |         |         |
  0+15       0.0659      4.93  V Q       |         |         |         |
  0+20       0.1034      5.44  V Q       |         |         |         |
  0+25       0.1427      5.70  V Q       |         |         |         |
  0+30       0.1850      6.15  V Q       |         |         |         |
  0+35       0.2328      6.93  V  Q      |         |         |         |
  0+40       0.2826      7.24  |V Q      |         |         |         |
  0+45       0.3333      7.35  |V Q      |         |         |         |
  0+50       0.3843      7.41  |V Q      |         |         |         |
  0+55       0.4355      7.44  |V Q      |         |         |         |
  1+ 0       0.4897      7.86  |V Q      |         |         |         |
```



U n i t H y d r o g r a p h A n a l y s i s

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Study date 11/08/21 File: PRD10024100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6406

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
PROPOSED CONDITION UNIT HYDROGRAPH - 100 YEAR HOUR STORM
HUNSAKER & ASSOCIATES, BRIAN LOWELL, PE

Drainage Area = 55.84(Ac.) = 0.087 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 55.84(Ac.) = 0.087 Sq. Mi.
Length along longest watercourse = 4101.00(Ft.)
Length along longest watercourse measured to centroid = 1105.00(Ft.)
Length along longest watercourse = 0.777 Mi.
Length along longest watercourse measured to centroid = 0.209 Mi.
Difference in elevation = 49.10(Ft.)
Slope along watercourse = 63.2158 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.082 Hr.
Lag time = 4.93 Min.
25% of lag time = 1.23 Min.
40% of lag time = 1.97 Min.
Unit time = 15.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	2.00	111.68

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
55.84	5.00	279.20

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.000(In)

Point rain (area averaged) = 5.000(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 4.999(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
55.840	65.70	0.500

Total Area Entered = 55.84(Ac.)

RI AMC2	RI AMC-3	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
65.7	82.4	0.216	0.500	0.119	1.000	0.119
					Sum (F) =	0.119

Area averaged mean soil loss (F) (In/Hr) = 0.119
Minimum soil loss rate ((In/Hr)) = 0.060
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.250	304.523	57.140	32.156
2	0.500	609.046	36.881	20.755
3	0.750	913.570	5.980	3.365
			Sum = 100.000	Sum= 56.276

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.25	0.20	0.040	(0.210)	0.020	0.020
2	0.50	0.30	0.060	(0.208)	0.030	0.030
3	0.75	0.30	0.060	(0.205)	0.030	0.030
4	1.00	0.40	0.080	(0.203)	0.040	0.040
5	1.25	0.30	0.060	(0.201)	0.030	0.030
6	1.50	0.30	0.060	(0.198)	0.030	0.030
7	1.75	0.30	0.060	(0.196)	0.030	0.030
8	2.00	0.40	0.080	(0.193)	0.040	0.040
9	2.25	0.40	0.080	(0.191)	0.040	0.040
10	2.50	0.40	0.080	(0.189)	0.040	0.040
11	2.75	0.50	0.100	(0.186)	0.050	0.050
12	3.00	0.50	0.100	(0.184)	0.050	0.050
13	3.25	0.50	0.100	(0.182)	0.050	0.050
14	3.50	0.50	0.100	(0.180)	0.050	0.050
15	3.75	0.50	0.100	(0.177)	0.050	0.050
16	4.00	0.60	0.120	(0.175)	0.060	0.060
17	4.25	0.60	0.120	(0.173)	0.060	0.060
18	4.50	0.70	0.140	(0.171)	0.070	0.070
19	4.75	0.70	0.140	(0.169)	0.070	0.070
20	5.00	0.80	0.160	(0.166)	0.080	0.080
21	5.25	0.60	0.120	(0.164)	0.060	0.060
22	5.50	0.70	0.140	(0.162)	0.070	0.070
23	5.75	0.80	0.160	(0.160)	0.080	0.080
24	6.00	0.80	0.160	(0.158)	0.080	0.080
25	6.25	0.90	0.180	(0.156)	0.090	0.090
26	6.50	0.90	0.180	(0.154)	0.090	0.090
27	6.75	1.00	0.200	(0.152)	0.100	0.100
28	7.00	1.00	0.200	(0.150)	0.100	0.100
29	7.25	1.00	0.200	(0.148)	0.100	0.100
30	7.50	1.10	0.220	(0.145)	0.110	0.110
31	7.75	1.20	0.240	(0.143)	0.120	0.120
32	8.00	1.30	0.260	(0.142)	0.130	0.130
33	8.25	1.50	0.300	0.140	(0.150)	0.160
34	8.50	1.50	0.300	0.138	(0.150)	0.162
35	8.75	1.60	0.320	0.136	(0.160)	0.184
36	9.00	1.70	0.340	0.134	(0.170)	0.206
37	9.25	1.90	0.380	0.132	(0.190)	0.248
38	9.50	2.00	0.400	0.130	(0.200)	0.270
39	9.75	2.10	0.420	0.128	(0.210)	0.292

```
40  10.00     2.20      0.440          0.126    (  0.220)        0.314
41  10.25     1.50      0.300          0.124    (  0.150)        0.175
42  10.50     1.50      0.300          0.123    (  0.150)        0.177
43  10.75     2.00      0.400          0.121    (  0.200)        0.279
44  11.00     2.00      0.400          0.119    (  0.200)        0.281
45  11.25     1.90      0.380          0.117    (  0.190)        0.263
46  11.50     1.90      0.380          0.116    (  0.190)        0.264
47  11.75     1.70      0.340          0.114    (  0.170)        0.226
48  12.00     1.80      0.360          0.112    (  0.180)        0.248
49  12.25     2.50      0.500          0.111    (  0.250)        0.389
50  12.50     2.60      0.520          0.109    (  0.260)        0.411
51  12.75     2.80      0.560          0.107    (  0.280)        0.453
52  13.00     2.90      0.580          0.106    (  0.290)        0.474
53  13.25     3.40      0.680          0.104    (  0.340)        0.576
54  13.50     3.40      0.680          0.102    (  0.340)        0.577
55  13.75     2.30      0.460          0.101    (  0.230)        0.359
56  14.00     2.30      0.460          0.099    (  0.230)        0.361
57  14.25     2.70      0.540          0.098    (  0.270)        0.442
58  14.50     2.60      0.520          0.096    (  0.260)        0.424
59  14.75     2.60      0.520          0.095    (  0.260)        0.425
60  15.00     2.50      0.500          0.093    (  0.250)        0.407
61  15.25     2.40      0.480          0.092    (  0.240)        0.388
62  15.50     2.30      0.460          0.091    (  0.230)        0.369
63  15.75     1.90      0.380          0.089    (  0.190)        0.291
64  16.00     1.90      0.380          0.088    (  0.190)        0.292
65  16.25     0.40      0.080       (  0.087)       0.040        0.040
66  16.50     0.40      0.080       (  0.085)       0.040        0.040
67  16.75     0.30      0.060       (  0.084)       0.030        0.030
68  17.00     0.30      0.060       (  0.083)       0.030        0.030
69  17.25     0.50      0.100       (  0.081)       0.050        0.050
70  17.50     0.50      0.100       (  0.080)       0.050        0.050
71  17.75     0.50      0.100       (  0.079)       0.050        0.050
72  18.00     0.40      0.080       (  0.078)       0.040        0.040
73  18.25     0.40      0.080       (  0.077)       0.040        0.040
74  18.50     0.40      0.080       (  0.076)       0.040        0.040
75  18.75     0.30      0.060       (  0.074)       0.030        0.030
76  19.00     0.20      0.040       (  0.073)       0.020        0.020
77  19.25     0.30      0.060       (  0.072)       0.030        0.030
78  19.50     0.40      0.080       (  0.071)       0.040        0.040
79  19.75     0.30      0.060       (  0.070)       0.030        0.030
80  20.00     0.20      0.040       (  0.069)       0.020        0.020
81  20.25     0.30      0.060       (  0.069)       0.030        0.030
82  20.50     0.30      0.060       (  0.068)       0.030        0.030
83  20.75     0.30      0.060       (  0.067)       0.030        0.030
84  21.00     0.20      0.040       (  0.066)       0.020        0.020
85  21.25     0.30      0.060       (  0.065)       0.030        0.030
86  21.50     0.20      0.040       (  0.064)       0.020        0.020
87  21.75     0.30      0.060       (  0.064)       0.030        0.030
88  22.00     0.20      0.040       (  0.063)       0.020        0.020
89  22.25     0.30      0.060       (  0.062)       0.030        0.030
90  22.50     0.20      0.040       (  0.062)       0.020        0.020
91  22.75     0.20      0.040       (  0.061)       0.020        0.020
92  23.00     0.20      0.040       (  0.061)       0.020        0.020
93  23.25     0.20      0.040       (  0.060)       0.020        0.020
94  23.50     0.20      0.040       (  0.060)       0.020        0.020
95  23.75     0.20      0.040       (  0.060)       0.020        0.020
96  24.00     0.20      0.040       (  0.060)       0.020        0.020
              (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    13.4
     Flood volume = Effective rainfall      3.35(In)
      times area      55.8(Ac.)/[(In)/(Ft.)] =      15.6(Ac.Ft)
     Total soil loss =      1.65(In)
     Total soil loss =     7.678(Ac.Ft)
     Total rainfall =      5.00(In)
     Flood volume =      678914.1 Cubic Feet
     Total soil loss =      334471.3 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =     32.134(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         24 - H O U R    S T O R M
```

R u n o f f H y d r o g r a p h

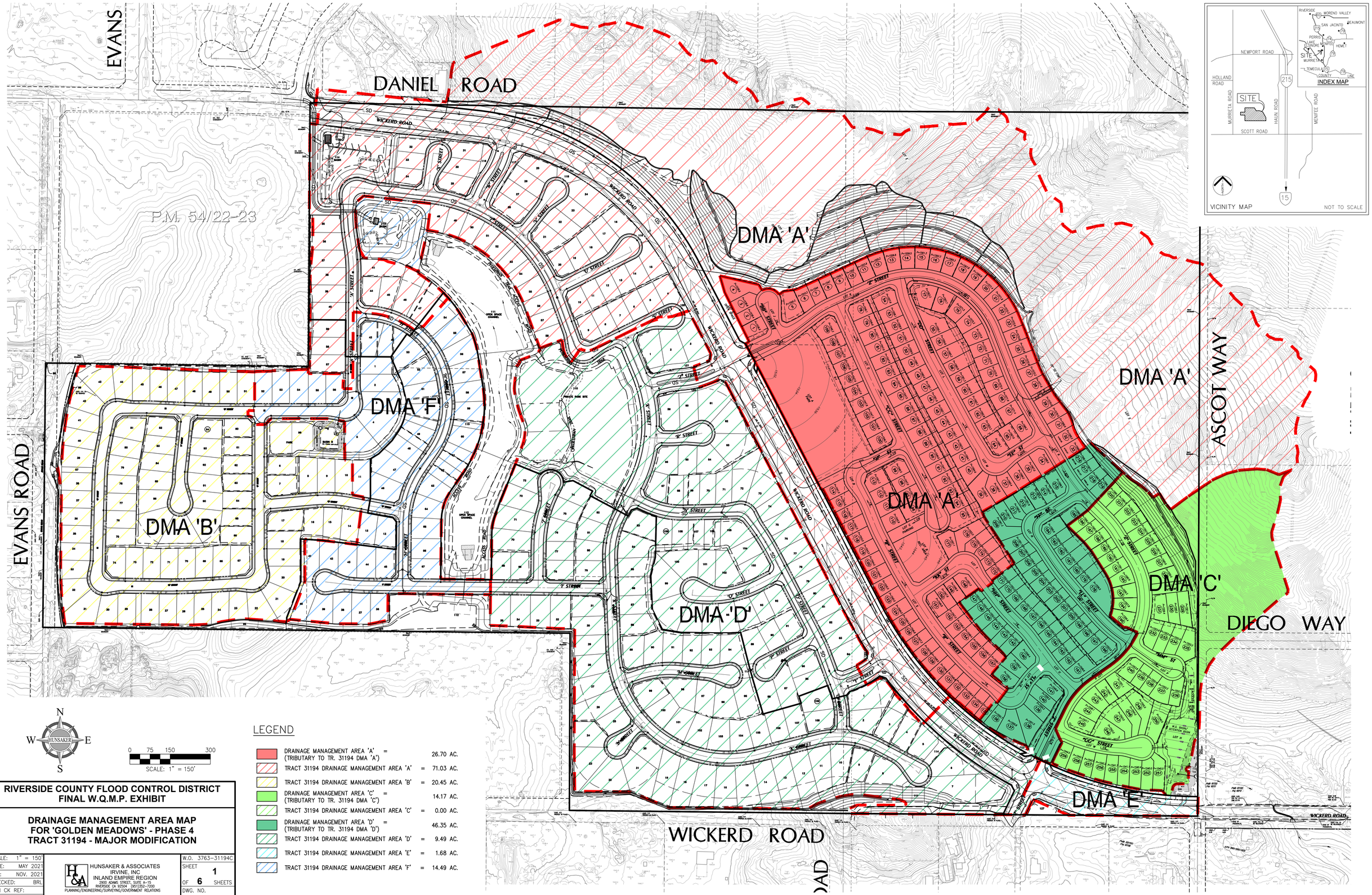
Hydrograph in 15 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 10.0 20.0 30.0 40.0
0+15	0.0133	0.64	Q
0+30	0.0418	1.38	VQ
0+45	0.0760	1.66	VQ
1+ 0	0.1176	2.01	V Q
1+15	0.1567	1.90	VQ
1+30	0.1923	1.72	VQ
1+45	0.2272	1.69	VQ
2+ 0	0.2688	2.01	V Q
2+15	0.3146	2.22	V Q
2+30	0.3611	2.25	V Q
2+45	0.4143	2.57	VQ
3+ 0	0.4718	2.78	VQ
3+15	0.5299	2.81	VQ
3+30	0.5881	2.81	VQ
3+45	0.6463	2.81	VQ
4+ 0	0.7111	3.14	V Q
4+15	0.7802	3.34	VQ
4+30	0.8566	3.70	VQ
4+45	0.9373	3.91	VQ
5+ 0	1.0254	4.26	V Q
5+15	1.1045	3.83	VQ
5+30	1.1823	3.77	Q
5+45	1.2697	4.23	VQ
6+ 0	1.3620	4.47	VQ
6+15	1.4617	4.83	VQ
6+30	1.5657	5.03	VQ
6+45	1.6771	5.39	VQ
7+ 0	1.7927	5.60	VQ
7+15	1.9090	5.63	VQ
7+30	2.0320	5.95	Q
7+45	2.1659	6.48	VQ
8+ 0	2.3114	7.04	V Q
8+15	2.4822	8.26	V Q
8+30	2.6679	8.99	V Q
8+45	2.8713	9.84	V Q
9+ 0	3.0987	11.01	V Q
9+15	3.3649	12.88	V Q
9+30	3.6651	14.53	V Q
9+45	3.9922	15.83	V Q
10+ 0	4.3446	17.06	V Q
10+15	4.6161	13.14	V Q
10+30	4.8311	10.40	Q V
10+45	5.1049	13.25	Q
11+ 0	5.4236	15.43	V Q
11+15	5.7381	15.22	VQ
11+30	6.0460	14.90	QV
11+45	6.3279	13.65	Q V
12+ 0	6.6080	13.55	Q V
12+15	6.9888	18.43	VQ
12+30	7.4464	22.14	V Q
12+45	7.9507	24.41	V Q
13+ 0	8.4888	26.04	V Q
13+15	9.1066	29.90	V Q
13+30	9.7705	32.13	V Q
13+45	10.2970	25.48	QV
14+ 0	10.7309	21.00	Q V
14+15	11.2044	22.92	Q V
14+30	11.7007	24.02	Q V
14+45	12.1957	23.96	Q V
15+ 0	12.6778	23.33	Q V
15+15	13.1396	22.35	Q V
15+30	13.5799	21.31	Q V
15+45	13.9586	18.33	Q V
16+ 0	14.3032	16.68	Q V

```
  16+15      14.4753      8.33  |       Q |         |         |      V  |
  16+30      14.5394      3.10  |   Q     |         |         |      V  |
  16+45      14.5793      1.93  |Q        |         |         |      V  |
  17+ 0      14.6149      1.72  |Q        |         |         |      V  |
  17+15      14.6630      2.33  | Q       |         |         |      V  |
  17+30      14.7198      2.75  | Q       |         |         |      V  |
  17+45      14.7780      2.81  | Q       |         |         |      V  |
  18+ 0      14.8295      2.49  | Q       |         |         |       V |
  18+15      14.8767      2.29  | Q       |         |         |       V |
  18+30      14.9232      2.25  | Q       |         |         |       V |
  18+45      14.9631      1.93  |Q        |         |         |       V |
  19+ 0      14.9921      1.40  |Q        |         |         |       V |
  19+15      15.0227      1.48  |Q        |         |         |       V |
  19+30      15.0635      1.98  |Q        |         |         |       V |
  19+45      15.1027      1.90  |Q        |         |         |       V |
  20+ 0      15.1316      1.40  |Q        |         |         |       V |
  20+15      15.1623      1.48  |Q        |         |         |       V |
  20+30      15.1965      1.66  |Q        |         |         |        V|
  20+45      15.2314      1.69  |Q        |         |         |        V|
  21+ 0      15.2596      1.37  |Q        |         |         |        V|
  21+15      15.2902      1.48  |Q        |         |         |        V|
  21+30      15.3178      1.33  |Q        |         |         |        V|
  21+45      15.3484      1.48  |Q        |         |         |        V|
  22+ 0      15.3759      1.33  |Q        |         |         |        V|
  22+15      15.4065      1.48  |Q        |         |         |        V|
  22+30      15.4341      1.33  |Q        |         |         |        V|
  22+45      15.4580      1.16  |Q        |         |         |        V|
  23+ 0      15.4813      1.13  |Q        |         |         |        V|
  23+15      15.5046      1.13  |Q        |         |         |        V|
  23+30      15.5278      1.13  |Q        |         |         |        V|
  23+45      15.5511      1.13  |Q        |         |         |        V|
  24+ 0      15.5744      1.13  |Q        |         |         |        V|
  24+15      15.5843      0.48  Q         |         |         |        V|
  24+30      15.5857      0.07  Q         |         |         |        V|
-------------------------------------------------------------------------
```

SECTION 4 - Hydrology Maps

- Drainage Management Area Map
- Existing Condition Hydrology Map
- Proposed Condition Hydrology Map



LEGEND

	DRAINAGE MANAGEMENT AREA 'A' (TRIBUTARY TO TR. 31194 DMA 'A')	=	26.70 AC.
	TRACT 31194 DRAINAGE MANAGEMENT AREA 'A'	=	71.03 AC.
	TRACT 31194 DRAINAGE MANAGEMENT AREA 'B'	=	20.45 AC.
	DRAINAGE MANAGEMENT AREA 'C' (TRIBUTARY TO TR. 31194 DMA 'C')	=	14.17 AC.
	TRACT 31194 DRAINAGE MANAGEMENT AREA 'C'	=	0.00 AC.
	DRAINAGE MANAGEMENT AREA 'D' (TRIBUTARY TO TR. 31194 DMA 'D')	=	46.35 AC.
	TRACT 31194 DRAINAGE MANAGEMENT AREA 'D'	=	9.49 AC.
	TRACT 31194 DRAINAGE MANAGEMENT AREA 'E'	=	1.68 AC.
	TRACT 31194 DRAINAGE MANAGEMENT AREA 'F'	=	14.49 AC.

RIVERSIDE COUNTY FLOOD CONTROL DISTRICT
FINAL W.Q.M.P. EXHIBIT

DRAINAGE MANAGEMENT AREA MAP
FOR 'GOLDEN MEADOWS' - PHASE 4
TRACT 31194 - MAJOR MODIFICATION

SCALE:	1" = 150'	W.O.	3763-31194C
DATE:	MAY 2021	SHEET	1
REV:	NOV. 2021	OF	6 SHEETS
CHECKED:	BRL	DWG. NO.	
PLN CK REF:			
F.B.			

HUNSAKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
3900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

PRINTED: 11/4/2021 4:53 PM

H:\00546\Planning\WQMP - Preliminary\Porte\Appendix 1 - Maps\SHT-01 - 00546-WQMP-DMA-MAP.dwg

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
EXISTING CONDITION

PREPARED BY:

HUNSAKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

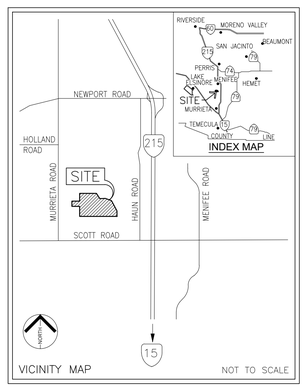
DATE PREPARED: MARCH 2019

N
W HUNSAKER E
S

1" = 200'
100 0 200

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
- D-9 / 5.08 — AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} = 40.5 cfs, Q_{100} = 72.8 cfs, Tc=11.8 MIN., INV= x — 10 YEAR STORM FLOW, 100 YEAR STORM FLOW, TIME OF CONCENTRATION (Q100), INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs, ΣQ_{100} = 72.8 cfs, Tc=11.8 MIN., INV= x — 10 YEAR STORM FLOW CONFLUENCE, 100 YEAR STORM FLOW CONFLUENCE, TIME OF CONCENTRATION (Q100), INVERT ELEVATION
- **AREA "B"** — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID



GARBANI ROAD
EVANS ROAD
WICKERD ROAD
MATCHLINE (SEE RIGHT)
MATCHLINE (SEE LEFT)

DMA 'A'
LL=4,753'
LC=1,892'

DMA 'B'
LL=1,350'
LC=615'

DMA 'C'
LL=1,415'
LC=500'

DMA 'D'
LL=2,270'
LC=1,705'

DMA 'E'
LL=8,270'
LC=2,705'

602 / 1504	Q_{10} =10.1 cfs, Q_{100}=18.0 cfs, Tc=20.4 MIN.
107 / 1504	ΣQ_{10} =226.4 cfs, ΣQ_{100}=389.1 cfs, Tc=19.6 MIN.
104 / 1514	ΣQ_{10} =197.7 cfs, ΣQ_{100}=338.1 cfs, Tc=17.8 MIN.
601 / 1509	Q_{10} =168.2 cfs, Q_{100}=289.8 cfs, Tc=17.5 MIN.
203 / 1509	Q_{10} =24.4 cfs, Q_{100}=43.0 cfs, Tc=17.4 MIN.
202 / 1515	Q_{10} = 9.3 cfs, Q_{100}=16.1 cfs, Tc=14.7 MIN.
106 / 1522	Q_{10} = 9.1 cfs, Q_{100}=15.0 cfs, Tc=15.8 MIN.
403 / 1527	Q_{10} = 76.9 cfs, Q_{100}=130.8 cfs, Tc=13.6 MIN.
105 / 1543	Q_{10} =30.9 cfs, Q_{100}=52.7 cfs, Tc=19.2 MIN.
201 / 1544	
504 / 1525	Q_{10} =326.4 cfs, Q_{100}=577.1 cfs, Tc=18.3 MIN.
402 / 1572	Q_{10} =16.4 cfs, Q_{100}=27.3 cfs, Tc=11.3 MIN.
401 / 1778	
503 / 1620	Q_{10} =98.6 cfs, Q_{100}=168.4 cfs, Tc=12.4 MIN.
502 / 1700	Q_{10} =12.8 cfs, Q_{100}=21.7 cfs, Tc=9.9 MIN.
102 / 1590	Q_{10} =13.0 cfs, Q_{100}=22.1 cfs, Tc=10.5 MIN.
101 / 1758	
301 / 1719	
103 / 1533	Q_{10} =75.7 cfs, Q_{100}=129.8 cfs, Tc=12.6 MIN.
302 / 1548	Q_{10} =11.0 cfs, Q_{100}=18.3 cfs, Tc=10.0 MIN.
303 / 1528	Q_{10} =30.0 cfs, Q_{100}=51.0 cfs, Tc=11.8 MIN.
501 / 1888	

A-1 / 7.85	
A-2 / 41.92	
A-3 / 73.60	
A-4 / 6.50	
A-5 / 18.32	
A-6 / 25.04	
B-1 / 6.91	
B-2 / 12.67	
C-1 / 6.3	
C-2 / 12.3	
D-1 / 10.0	
D-2 / 41.80	
E-1 / 7.47	
E-2 / 56.42	
E-3 / 194.5	
F-1 / 9.25	

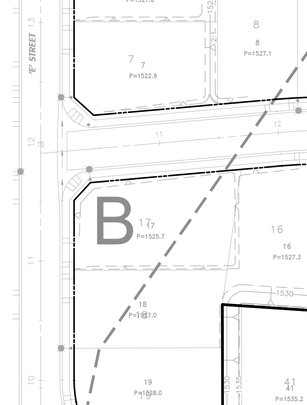
L=753' L=807' L=903' L=1,843' L=1,212' L=756' L=860' L=587' L=783' L=706' L=687' L=701' L=1,105' L=1,668' L=756'

PLOTTED BY: Joanna Swidkowska DATE: Nov. 08, 2021 04:25:54 PM FILE: H:\00546\Planning\Drainage\Perris\Maps\00546-SHT-01-HY-EX.dwg

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'A' - PROPOSED DEVELOPMENT

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
- D-9 / 5.08 — AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} = 40.5 cfs; Q_{100} = 72.8 cfs; Tc = 11.8 MIN.; INV = x — 10 YEAR STORM FLOW; 100 YEAR STORM FLOW; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs; ΣQ_{100} = 72.8 cfs; Tc = 11.8 MIN.; INV = x — 10 YEAR STORM FLOW CONFLUENCE; 100 YEAR STORM FLOW CONFLUENCE; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- **AREA "B"** — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID



N / W HUNSAKER E / S

1" = 60'
30 0 60

PREPARED BY:

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IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

PREPARED BY:

MATCHLINE (SEE SHEET 2)

PLOTTED BY: Joanna Smolkowski DATE: Nov. 08, 2021 11:15:58 AM FILE: H:\1000-69 Planning\Drainage\Porto\Mapp\AREA A-HYD MAP.dwg

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'A' - PROPOSED DEVELOPMENT

N
W HUNSKER E
S

1" = 60'
30 0 60

PREPARED BY:

HUNSKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

PREPARED ON: MARCH 2019

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
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- AREA "B" — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID

DMA 'A'

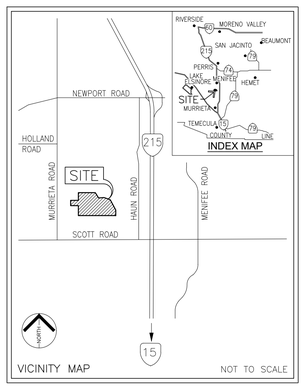
LL=5,833'
LC=2,440'

DRAINAGE AREA C
SHEET SHEET 4
1.3 AC

MATCHLINE (SEE SHEET 1)

PLOTTED BY: Joanna Swiatkowska DATE: Nov. 08, 2021 11:30:14 AM FILE: H:\(00546)\Planning\Drainage\Parts\Maps\AREA A-HYD MAP.dwg

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'C' - PROPOSED DEVELOPMENT



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RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

DATE PREPARED: MARCH 2019

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY (B / C)
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
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- Tc=11.8 MIN. — TIME OF CONCENTRATION (Q100)
- INV=x — INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs, ΣQ_{100} = 72.8 cfs — 10 YEAR STORM FLOW CONFLUENCE / 100 YEAR STORM FLOW CONFLUENCE
- Tc=11.8 MIN. — TIME OF CONCENTRATION (Q100)
- INV=x — INVERT ELEVATION
- AREA "B" — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID

N W E S HUNSAKER

1" = 60'
30 0 60

DRAINAGE AREA A
SEE SHEET 2

DRAINAGE AREA A
SEE SHEET 2

309
1719.9

312
1595.0

300
1566.1

C-4
2.44

C-1
1.27

C-2
2.43

C-6
2.69

310
1580.0
Q_{10} = 4.5 cfs
Q_{100} = 7.3 cfs
Tc=9.6 MIN.

LL=1,178'
LC=347'

301
1554.0
Q_{10} = 2.15 cfs
Q_{100} = 3.64 cfs
Tc=9.9 MIN.
INV=1546.0

303
1554.0
Q_{10} = 4.0 cfs
Q_{100} = 6.8 cfs
Tc=10.3 MIN.
INV=1546.0

302
1553.0
ΣQ_{10} = 6.1 cfs
ΣQ_{100} = 10.4 cfs
Tc=10.3 MIN.
INV=1545.0

C-3
1.37

307
1551.9

304
1553.5
Q_{10} = 8.2 cfs
Q_{100} = 13.9 cfs
Tc=10.8 MIN.
INV=1540.0

305
1553.5
Q_{10} = 2.1 cfs
Q_{100} = 3.7 cfs
Tc=11.2 MIN.
INV=1540.2

306.1
1535.0
Q_{10} = 8.2 cfs
Q_{100} = 13.9 cfs
Tc=11.1 MIN.
INV=1535.0

306.3
1535.0
Q_{10} = 9.1 cfs
Q_{100} = 15.1 cfs
Tc=10.2 MIN.

ΣQ_{10} = 22.1 cfs
ΣQ_{100} = 36.9 cfs
T_c = 10.2 MIN.

C-9
0.76

C-7
3.23

308
1538.6
Q_{10} = 4.9 cfs
Q_{100} = 8.3 cfs
Tc=12.3 MIN.
INV=1532.0

306.2
1531.0
Q_{10} = 4.9 cfs
Q_{100} = 8.3 cfs
Tc=12.4 MIN.
INV=1531.0

"EE" ST
"FF" ST
"GG" STREET
"HH" STREET
"II" STREET
"JJ" ST
"KK" ST
"LL" STREET
"MM" ST
"O" STREET
"P" STREET
"A" STREET
"K" STREET
"Z" STREET
WICKERD ROAD
LOT C PARKING
LOT I PVT DWY
ACCESS ROAD

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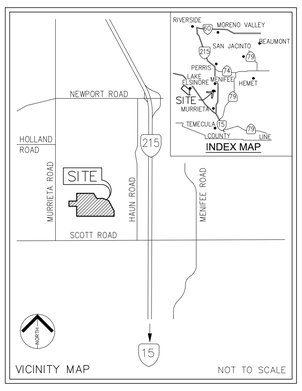
MATCHLINE (SEE BELOW)

MATCHLINE (SEE SHEET 3)

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'D' - PROPOSED DEVELOPMENT

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
- D-9 / 5.08 — AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} = 40.5 cfs; Q_{100} = 72.8 cfs; Tc=11.8 MIN.; INV=x — 10 YEAR STORM FLOW; 100 YEAR STORM FLOW; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs; ΣQ_{100} = 72.8 cfs; Tc=11.8 MIN.; INV=x — 10 YEAR STORM FLOW CONFLUENCE; 100 YEAR STORM FLOW CONFLUENCE; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- **AREA "B"** — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID



N / W HUNSAKER E / S

1" = 60'

PREPARED BY:

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2900 ADAMS STREET, SUITE A-15
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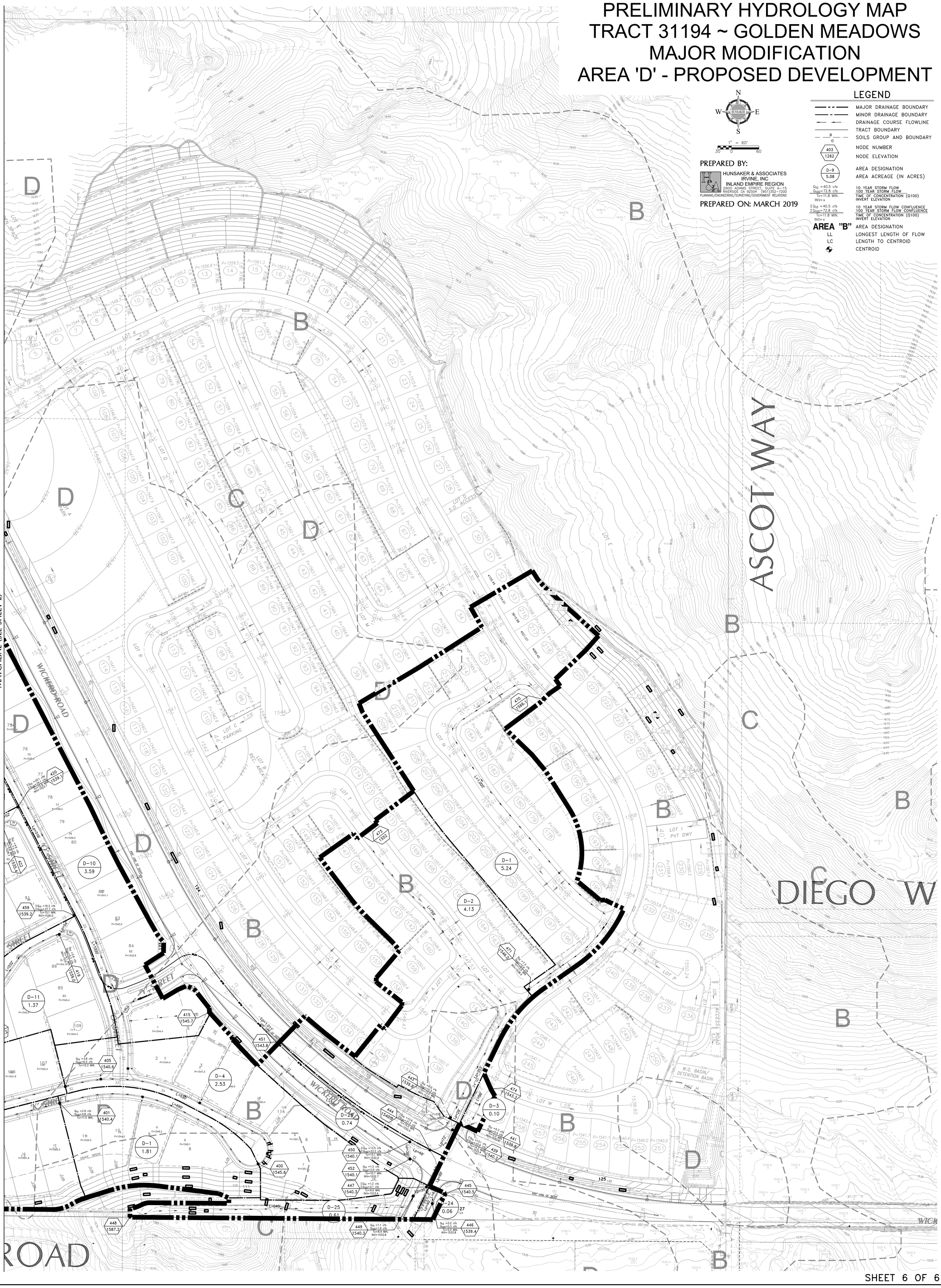
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

PREPARED BY:

MATCHLINE (SEE ABOVE)

PLOTTED BY: Brian Lowell DATE: May 18, 2021 11:00:26 PM FILE: H:\30546\Planning Drainage\Perris Maps\30546 - SHT-02-HY-PRE-D-MOD.dwg

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'D' - PROPOSED DEVELOPMENT



N
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1" = 60'
30 0 60

PREPARED BY:

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PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

PREPARED ON: MARCH 2019

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
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- AREA "B" — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID

MATCHLINE (SEE SHEET 2)

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Appendix F. Water Quality Management Plan

Preliminary
Water Quality Management Plan
Tract 31194 – 'Golden Meadows' – Phase 4
Major Modification (WQ-0243)

Prepared for

Richland Communities, Inc.

May 2021

Revised: November 2021

Hunsaker & Associates

Preliminary Water Quality Management Plan
Tract 31194 – 'Golden Meadows' – Phase 4
Major Modification (WQ-0243)

May 2021
Rev: Nov. 2021

Hunsaker & Associates

CITY OF MENIFEE
WQMP Checklist

Checklist for Identifying Projects Requiring a Project-Specific WQMP within the Santa Ana Region

Project File No.:	Tract 31194 - Phase 4
Project Name:	Golden Meadows Phase 4 - Major Modification
Project Location:	North west of the intersection of Evans Road and Wickerd Road
Project Description:	Residential Tract Development

Proposed Project Consists of or Includes:	Yes	No
Significant Redevelopment: The addition or replacement of 5,000 square feet or more of impervious surface on an already developed site. Does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the constructed facility or emergency redevelopment activity required to protect public health and safety.		X
Residential developments that create 10,000 square feet or more of impervious surface (collectively over the entire project site), including residential housing subdivisions requiring a Final Map (i.e., detached single family home subdivisions, multi-family attached subdivisions, condominiums, or apartments, etc.).	X	
New industrial and commercial projects that create 10,000 square feet or more of impervious surface requiring a Final Map. .		X
Mixed use developments that create 10,000 square feet or more of impervious surface (collectively over the entire project site).		X
Automotive repair shops [Stancard Industrial Classification (SIC) codes[1] 5013, 5014, 5541, 7532, 7533, 7534, 7536, 7537, 7538, and 7539].		X
Restaurants (SIC code 5812) where the land area of development is 5,000 square feet or more.		X
Hillside developments disturbirg 5,000 square feet or more which are located on areas with known erosive soil conditions or where the natural slope is 25 percent or more.		X
Developments of 2,500 square feet of impervious surface or more adjacent to (within 200 feet) or discharging directly into ESAs. "Directly" means situated within 200 feet of the ESA; "discharging directly" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.		X
Parking lots of 5,000 square feet or more exposed to stormwater, where "parking lot" is defined as a land area or facility for the temporary parking or storage of motor vehicles.		X
Retail Gasoline Outlets that are either 5,000 square feet or more of impervious surface with a projected average daily traffic of 100 or more vehicles per day.		X
Public Projects, other than Trarsportation Projects, that are implemented by a Permittee and similar in nature to the priority projects described above and meets the thresholds described herein.		X
Other Development Projects whose site conditions or activity pose the potential for significant adverse impacts to water quality.		X

1 Descriptions of SIC codes can be found at http://www.osha.gov/pls/imis/sicsearch.html.

DETERMINATION: Circle appropriate determination

Any questions answered "YES" ⟶ Project requires a project-specific WQMP.

All questions are answered "NO" ⟶ Project requires incorporation of Site Design and Source Control BMPs imposed through Conditions of Approval or permit conditions.

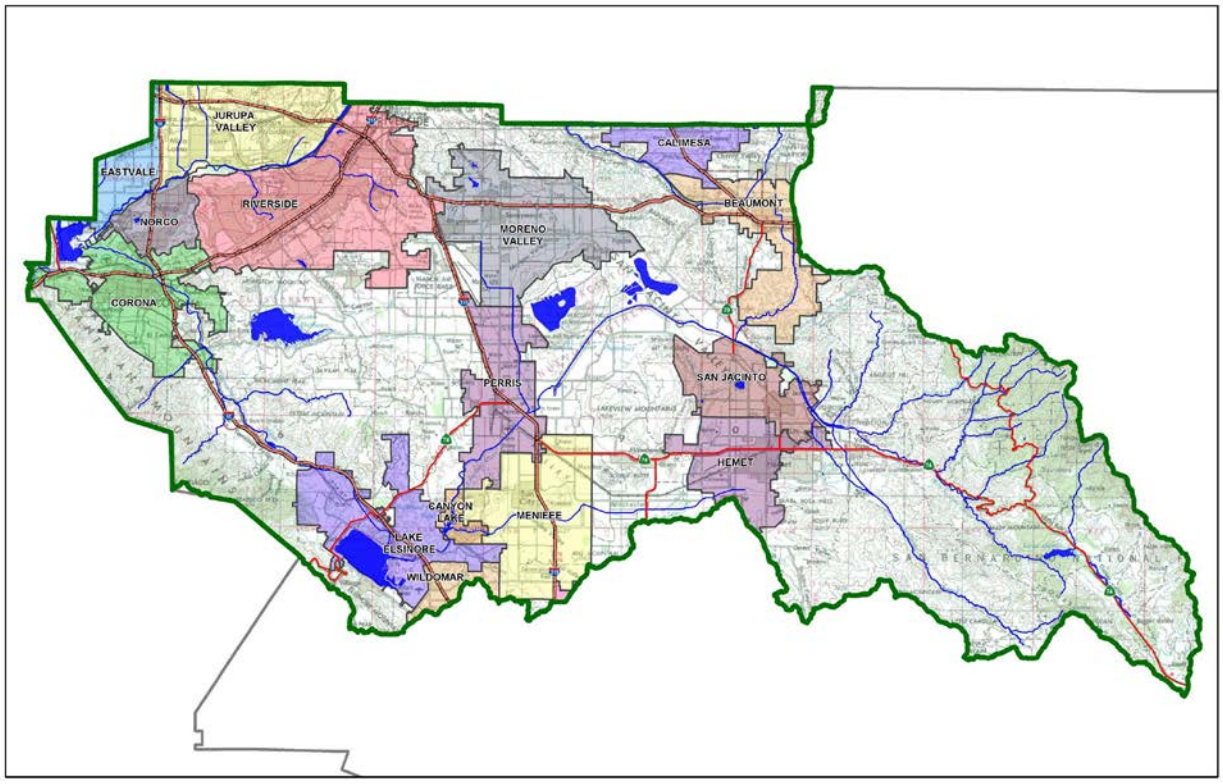
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Golden Meadows – Phase 4 – Major Modification

Development No: Tract Map Number 31194 – Phase 4

Design Review/Case No: WQ-0243



☒ **Preliminary**
☐ **Final**

Original Date Prepared: May 14, 2021

Revision Date(s):November 2, 2021

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**
Template revised June 30, 2016

Contact Information:

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Prepared by:
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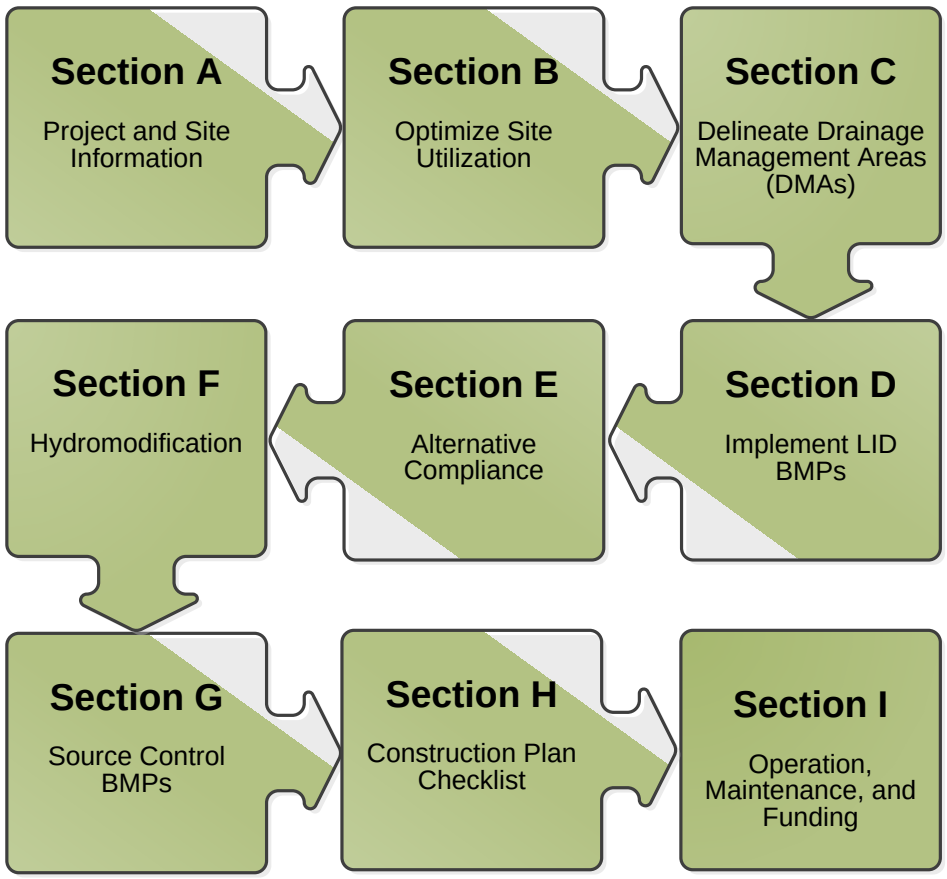
Adams Street; Suite A-15
Riverside, CA 92504
By: Brian Lowell, PE
Phone: (951) 352-7200

A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for **Richland Communities, Inc.** by **Hunsaker & Associates, Irvine Inc.** for the **Golden Meadows, Phase 4** project.

This WQMP is intended to comply with the requirements of the County or Riverside and the City of Menifee for City Ordinance Number 457, which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City of Menifee Water Quality Ordinance number 457.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	November 2, 20210 Date
Brian Lowell, PE Preparer's Printed Name	Engineer Preparer's Title/Position

Preparer's Licensure:

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Detached Single Family Residential
Planning Area:	N/A
Community Name:	Golden Meadows, Phase 4
Development Name:	Tract Map 31194

PROJECT LOCATION
Latitude & Longitude (DMS): 33°39'8.59"N, 117°11'28.81"W
Project Watershed and Sub-Watershed: Santa Ana River Watershed – San Jacinto Sub-Watershed
Gross Acres: 86.06 acres
APN(s): portions of: 360-300-002; 360-300-003; 360-300-004; 360-300-005; 360-300-006; 360-300-009; 360-350-001
Map Book and Page No.: Thomas Brothers Map Page 868, Grid B-7, C-7 and D-7

PROJECT CHARACTERISTICS		
Proposed or Potential Land Use(s)	Detached Single Family Residential	
Proposed or Potential SIC Code(s)	1521 – Single Family Residential	
Existing Area of Impervious Project Footprint (SF)	0 sf	
Total Area of proposed Impervious Surfaces within the Project Footprint (SF)/or Replacement	1,042,502 sf	
Does the project consist of offsite road improvements?	☐ Y	☒ N
Does the project propose to construct unpaved roads?	☐ Y	☒ N
Is the project part of a larger common plan of development (phased project)?	☒ Y	☐ N

EXISTING SITE CHARACTERISTICS		
Total area of existing Impervious Surfaces within the Project limits Footprint (SF)	0 sf	
Is the project located within any MSHCP Criteria Cell?	☐ Y	☒ N
If so, identify the Cell number:	n/a	
Are there any natural hydrologic features on the project site?	☐ Y	☒ N
Is a Geotechnical Report attached?	☒ Y	☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	n/a	
What is the Water Quality Design Storm Depth for the project?	0.60n.	

Project Description

The proposed development associated with this PWQMP is intended to be a modification to the approved water quality management plan for tract 31194. The portion of tract 31194 that is being revised consists of modifying drainage management areas 'A', 'C' and 'D'. The proposed modifications will increase the residential density and therefore change the hydraulic analysis and water quality objectives.

The underlying project known as Tract 31194 "Golden Meadows" consists of 206.8 acres, and proposes the construction of 474 single family homes (103.2 ac.), 7.3 acres of park, 50.0 acres of open space, 2.7 acres of basins and 43.6 acres of paved streets, un-paved trails, and general improvements related to a residential development. The proposed project site is located within the San Jacinto watershed portion Santa Ana River, within the City of Menifee, in the County of Riverside, California. The project site is bounded by Wickerd Road to the north, Ascot Way to the east, vacant land to the south and Evans Road to the west (see included vicinity map).

Proposed Conditions

As required by the Riverside Regional Water Quality Control Board (Santa Ana Watershed), and the MS4 Permit (Municipal Separate Storm Sewer System), the proposed grading of this site has been designed to be consistent with the existing drainage patterns. The portion of the project that is being modified has three distinct on-site drainage areas, area 'A', 'C' and 'D'. DMA 'A' drains approximately 95.9 acres into Water Quality / Detention Basin 'A', located at the northwestern most corner of the site. The second drainage area (drainage management area 'C') drains approximately 14.2 acres into Water Quality / Detention Basins 'B', located in the south eastern most corner of the project. The third drainage area (drainage management area "D") drains approximately 54.5 acres into Water Quality / Detention Basin D.

The proposed on-site water quality and detention basins are being designed to meet water quality requirements and mitigate for any increase in run-off associated with the development of areas 'A', 'C' and 'D'. Furthermore, basins A and C are being designed as 'Extended Detention Basins', each which will include a concrete lined forebay, low flow gravel diversion channels, and a sand filter with a metered outlet structure. Basin D is designed as an infiltration basin, which is sized to capture and infiltrate the water quality volume in its entirety.

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling
- BMP Locations (Lat/Long)

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Existing Paloma Valley High School Channel	None	None	No RARE designation
Salt Creek Channel	None	none	No RARE designation
Canyon Lake (a.k.a. San Jacinto River Reach 2)Hydrologic Unit 802.11	Pathogens, Nutrients	MUN, AGR, GWR, REC1, REC2, WARM, WILD	No RARE designation
San Jacinto River (Reach 1) Hydrologic Unit 802.32	None	GWR, MUN, AGR, REC1, REC2, WARM, WILD	No RARE designation
Lake Elsinore Santa Ana River Basin WQCP Hydrologic Unit 802.31	Nutrients, organic enrichment/low dissolved oxygen, PCBs, sediment toxicity, unknown toxicity	REC1, REC2, WARM, WILD	No RARE designation

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☒ Y	☐ N
US Army Corps of Engineers, CWA Section 404 Permit	☒ Y	☐ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☒ Y	☐ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* State Department of Fish and Game, 1602 Streambed Alteration Agreement City of Menifee Grading Permit	☒ Y	☐ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, constraints might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. Opportunities might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Consideration of "highest and best use" of the discharge should also be considered. For example, Lake Elsinore is evaporating faster than runoff from natural precipitation can recharge it. Requiring infiltration of 85% of runoff events for projects tributary to Lake Elsinore would only exacerbate current water quality problems associated with Pollutant concentration due to lake water evaporation. In cases where rainfall events have low potential to recharge Lake Elsinore (i.e. no hydraulic connection between groundwater to Lake Elsinore, or other factors), requiring infiltration of Urban Runoff from projects is counterproductive to the overall watershed goals. Project proponents, in these cases, would be allowed to discharge Urban Runoff, provided they used equally effective filtration-based BMPs.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

- *Yes, the development will mimic the sites existing drainage patterns, which flow typically north and east in both the existing and proposed conditions.*

Did you identify and protect existing vegetation? If so, how? If not, why?

- *Where feasible, the existing vegetation will be preserved. This is anticipated to be accomplished on only a very small portion of the site, if at all. However, the development proposes open space, common open space and private landscaping within the residential lots.*

Did you identify and minimize impervious area? If so, how? If not, why?

- *The projects streets were designed to meet the minimum width requirements per the City of Menifee design standards.*

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

- *Where feasible, landscape lots are included into the site design to receive runoff prior to being conveyed to the site's storm drain system.*

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1][2]	Area (Sq. Ft.)			DMA Type
DMA 'A'	Mixed	A-1	Roof	412,000 sf	Type 'D', Areas Draining to BMPs
		A-2	Driveways	65,920 sf	
		A-3	Pavement	658,876 sf	
		A-4	Sidewalk	140,733 sf	
		A-5	Parkway	161,310 sf	
		A-6	Slopes	423,953 sf	
		A-7	Turf	767,086 sf	
		A-8	Natural	1,428,998 sf	
		A-9	Basin Bottom	31,401 sf	
		A-10	DG Trail	32,689 sf	
		A-11	Open Space	139,981 sf	
		1,162,979 sf modification to overall DMA 'A' (4,262,947 sf)			
DMA 'C'	Mixed	C-1	Roof	100,000 sf	Type 'D', Areas Draining to BMPs
		C-2	Driveways	16,000 sf	
		C-3	Pavement	53,588 sf	
		C-4	Sidewalk	16,156 sf	
		C-5	Parkway	10,601 sf	
		C-6	Slopes	69,626 sf	
		C-7	Turf	131,267 sf	
		C-8	Basin	15,559 sf	
		C-9	DG Road	6,452 sf	
		C-10	Natural	198,182 sf	
		617,431 sf modification to overall DMA 'C' (617,431 sf)			
DMA 'D'	Mixed	D-1	Roof	378,000 sf	Type 'D', Areas Draining to BMPs
		D-2	Driveways	60,480 sf	
		D-3	Pavement	395,799 sf	
		D-4	Sidewalk	112,435 sf	
		D-5	Parkway	83,596 sf	
		D-6	Slopes	137,022 sf	
		D-7	Turf	1,098,384 sf	
		D-8	Open Space	107,591 sf	
		D-9	Basin Bottom	56,338 sf	
		D-10	DG Access Road	2,670 sf	
		413,191 sf modification to overall DMA 'D' (2,432,315 sf)			

[1] *Reference Table 2-1 in the WQMP Guidance Document to populate this column*

[2] *If multi-surface provide back-up*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)			Stabilization Type	Irrigation Type (if any)
DMA 'A'	A-5	Parkway	161,310 sf	Landscape	Efficient irrigation, and drip irrigation where feasible
	A-6	Slopes	423,953 sf		
	A-7	Turf	767,086 sf		
	A-11	Open Space	139,981 sf		
DMA 'C'	C-5	Parkway	10,601 sf	Landscape	Efficient irrigation, and drip irrigation where feasible
	C-6	Slopes	69,626 sf		
	C-7	Turf	131,267 sf		
DMA 'D'	D-5	Parkway	83,596 sf	Landscape	Efficient irrigation, and drip irrigation where feasible
	D-6	Slopes	137,022 sf		
	D-7	Turf	1,098,384 sf		
	D-8	Open Space	107,591 sf		

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]
n/a						

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					**Receiving Self-Retaining DMA**		
DMA Name/ ID	Area (square feet) [A]	Post-project surface type	Impervious fraction [B]	Product [C] = [A] x [B]	DMA name /ID	Area (square feet) [D]	Ratio [C]/[D]
n/a							

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA 'A'	Extended Detention Basin DMA 'A'
DMA 'C'	Extended Detention Basin DMA 'C'
DMA 'D'	Infiltration Basin DMA 'D'

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

If yes has been checked, Infiltration BMPs shall not be used for the site; proceed to section D.3

If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: DMA 'A', DMA 'B', DMA 'E'		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☒The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired. **DMA 'D' will infiltrate only.**

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If none of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.
Total Area of Irrigated Landscape (public landscape): **DMA 'A' – 585,263 sf (13.44 ac)**
DMA 'C' – 80,227 sf (1.84 ac)
DMA 'D' – 220,618 sf (5.06 ac)
Type of Landscaping (Conservation Design or Active Turf): Conservative Design

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.
Total Area of Impervious Surfaces: **DMA 'A' – 1,277,529 sf (29.33 ac)**
DMA 'C' – 185,744 sf (4.26 ac)
DMA 'D' – 946,714 sf (21.73 ac)

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: 0.79

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.
Minimum required irrigated area: **DMA 'A' – 1,009,248 sf (23.17 ac)**
DMA 'C' – 146,738 sf (3.37 ac)
DMA 'D' – 747,904 sf (17.17 ac)

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
DMA 'A' – 1,009,248 sf (23.17 ac)	**DMA 'A' – 585,263 sf (13.44 ac)**
DMA 'C' – 146,738 sf (3.37 ac)	**DMA 'C' – 80,227 sf (1.84 ac)**
DMA 'D' – 747,904 sf (17.17 ac)	**DMA 'D' – 220,618 sf (5.06 ac)**

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:
Projected Number of Daily Toilet Users:

DMA 'A' – 206 dwelling units * 3.5 toilet users per D.U = 721 toilet users
DMA 'C' – 50 dwelling units * 3.5 toilet users per D.U = 175 toilet users
DMA 'D' – 189 dwelling units * 3.5 toilet users per D.U = 661.5 toilet users

Project Type: Residential

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.
Total Area of Impervious Surfaces: **DMA 'A' – 1,277,529 sf (29.33 ac)**
DMA 'C' – 185,744 sf (4.26 ac)
DMA 'D' – 946,714 sf (21.73 ac)

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-2 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: 101 TU/Ac

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.
Minimum number of toilet users: **DMA 'A' – 2,962 tu**
DMA 'C' – 430 tu
DMA 'D' – 2,195 tu

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
DMA 'A' – 2,962 tu	**DMA 'A' – 721 tu**
DMA 'C' – 430 tu	**DMA 'C' – 175 tu**
DMA 'D' – 2,195 tu	**DMA 'D' – 661 tu**

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

none

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment per Section 3.4.2 of the WQMP Guidance Document.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
A	☐	☐	☐	☒	☐
	☐	☐	☐	☐	☐
C	☐	☐	☐	☒	☐
D	☒	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

n/a

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First, calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Drainage Management Area 'A' V_{bmp} Analysis

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
A-1 Roof	412,000	Roofs	1	*0.89*	*367,504*			
A-2 Driveways	65,920	Concrete or Asphalt	1	*0.89*	*58,800.6*			
A-3 Pavement	658,876	Concrete or Asphalt	1	*0.89*	*587,717.4*			
A-4 Sidewalk	140,733	Concrete or Asphalt	1	*0.89*	*125,533.8*			
A-5 Parkway	161,310	Ornamental Landscaping	0.1	*0.11*	*17,818*			
A-6 Slopes	423,953	Ornamental Landscaping	0.1	*0.11*	*46,829*			
A-7 Turf	767,086	Ornamental Landscaping	0.1	*0.11*	*84,730.8*			
A-8 Natural	1,428,998	Natural (A Soil)	0.03	*0.06*	*89,371.2*			
A-9 Basin Bottom	31,401	Natural (A Soil)	0.03	*0.06*	*1,963.9*			
A-10 DG Trail	32,689	Decomposed Granite	0.4	*0.28*	*9,143.5*			
A-11 Open Space	139,981	Ornamental Landscaping	0.1	*0.11*	*15,462*			
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]
	4,262,947				1,404,874.2	0.60	70,243.7	70,500

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Drainage Management Area 'C' V_{bmp} Analysis

Table D.4 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
C-1 Roof	100,000	Roofs	1	0.89	89,200			
C-2 Driveways	16,000	Concrete or Asphalt	1	0.89	14,272			
C-3 Pavement	53,588	Concrete or Asphalt	1	0.89	47,800.5			
C-4 Sidewalk	16,156	Concrete or Asphalt	1	0.89	14411.2			
C-5 Parkway	10,601	Ornamental Landscaping	0.1	0.11	1,171			
C-6 Slopes	69,626	Ornamental Landscaping	0.1	0.11	7,690.7			
C-7 Res	131,267	Ornamental Landscaping	0.1	0.11	14,499.5			
C-8 Basin	15,559	Natural (A Soil)	0.03	0.06	973.1			
C-9 DG Road	6,452	Decomposed Granite	0.4	0.28	1,804.7			
C-10 Natural	198,182	Natural (A Soil)	0.03	0.06	12,394.5			
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]
	617,431				204,217.2	0.60	10,210.9	13,000

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Drainage Management Area 'D' V_{bmp} Analysis

Table D.5 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D-1 Roof	*378,000*	*Roofs*	*1*	*0.89*	*337,173*			
D-2 Driveways	*60,480*	*Concrete or Asphalt*	*1*	*0.89*	*53,948.2*			
D-3 Pavement	*395,799*	*Concrete or Asphalt*	*1*	*0.89*	*353,052.7*			
D-4 Sidewalk	*112,435*	*Concrete or Asphalt*	*1*	*0.89*	*100,292*			
D-5 Parkway	*83,596*	*Ornamental Landscaping*	*0.1*	*0.11*	*9,233.8*			
D-6 Slopes	*137,022*	*Ornamental Landscaping*	*0.1*	*0.11*	*15,135.2*			
D-7 Turf	*1,098,384*	*Ornamental Landscaping*	*0.1*	*0.11*	*121,325.3*			
D-8 Open Space	*107,591*	*Ornamental Landscaping*	*0.1*	*0.11*	*11,884.3*			
D-9 Basin Bottom	*56,338*	*Natural (A Soil)*	*0.03*	*0.06*	*3.523.4*			
D-10 DG Access Road	*2,670*	*Decomposed Granite*	*0.4*	*0.06*	*746.8*			
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]
	2,432,315				1,006,317.7	0.60	50,315.9	51,000

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Co-permittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

DMA 'A'	2 year – 24 hour		
	Pre-condition	Post-condition	% Difference
Time of Concentration	23.97 min.	14.85 min.	-38.0 %
Volume (Cubic Feet)	125,888 cf	322,344 cf	256 %

DMA 'C'	2 year – 24 hour		
	Pre-condition	Post-condition	% Difference
Time of Concentration	12.54 min.	10.38 min.	-17.2 %
Volume (Cubic Feet)	13,504 cf	46,609 cf	345 %

DMA 'D'	2 year – 24 hour		
	Pre-condition	Post-condition	% Difference
Time of Concentration	14.53 min.	19.12 min.	31.6 %
Volume (Cubic Feet)	43,560 cf	202,554 cf	465 %

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

The anticipated increase in both storm volume and time of concentration are being mitigated by the proposed water quality and detention basins. Full basin routing analysis will be provided during final engineering. In the preliminary hydrology design stage, the basins are being sized to accept the mitigation volume in its entirety. The mitigation volume is the difference between the existing and developed condition storm volumes.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Susceptibility Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

F.3 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff Pollutants	Structural Source Control BMPs	Operational Source Control BMPs
On-site storm drain inlets	Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Makers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as

		to create a potential discharge to storm drains."
Landscape/Outdoor Pesticide Use	Preserve, existing native trees, shrubs, and ground cover to the maximum extent possible. Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaping areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	Maintain landscaping using minimum or no pesticides. See applicable operation BMPs in "What you show know for…..Landscaping and Gardening". Provide IPM information to new owners, lessees and operators.
Pools, spas, ponds, decorative fountains, and other water features.	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain"
Vehicle/Equipment Repair and Maintenance	Vehicle repairs shall be kept to those that can be considered "self-contained". Clean-up methods shall be done by dry methods. Fluids drained from a vehicle should be contained in a recyclable container and turned into a local facility for recycling.	No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinse water from parts cleaning into storm drains.
Fire Sprinkler Test Water	Fire sprinkler test water shall be drained to the sanitary sewer.	See the note in Fact Sheet SC – 41, "Building and Grounds Maintenance,' in the CASQA Stormwater Quality Handbooks at ww.cabmphandbooks.com
Miscellaneous Drain or Wash Water or Other Sources Roofing, gutters, and trim	Avoid roofing, gutters, and trim made of copper or other unprotected metals	

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	BMP Location (Lat/Long)
DMA 'A'	Extended Detention Basin DMA 'A'	Rough Grading Plan	LAT: 33°39'17.97"N LON:117°11'41.01"W
DMA 'C'	Infiltration Basin DMA 'C'	Rough Grading Plan	LAT: 33°38'57.24"N LON:117°11'05.02"W
DMA 'D'	Infiltration Basin DMA 'D'	Rough Grading Plan	LAT: 33°39'08.30"N LON:117°11'32.55"W

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: Home Owners Association (HOA)

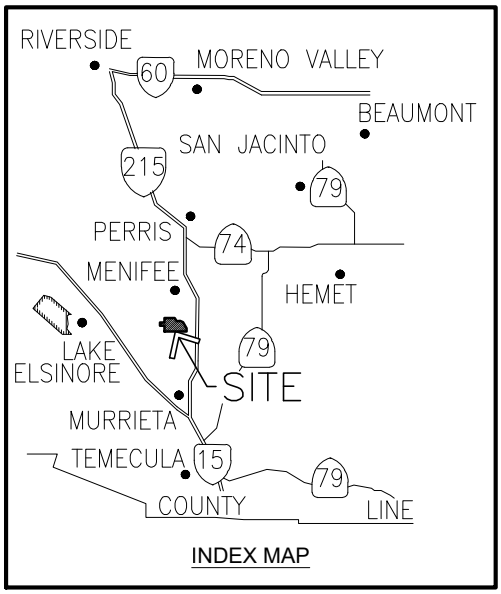
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☒ Y ☐ N

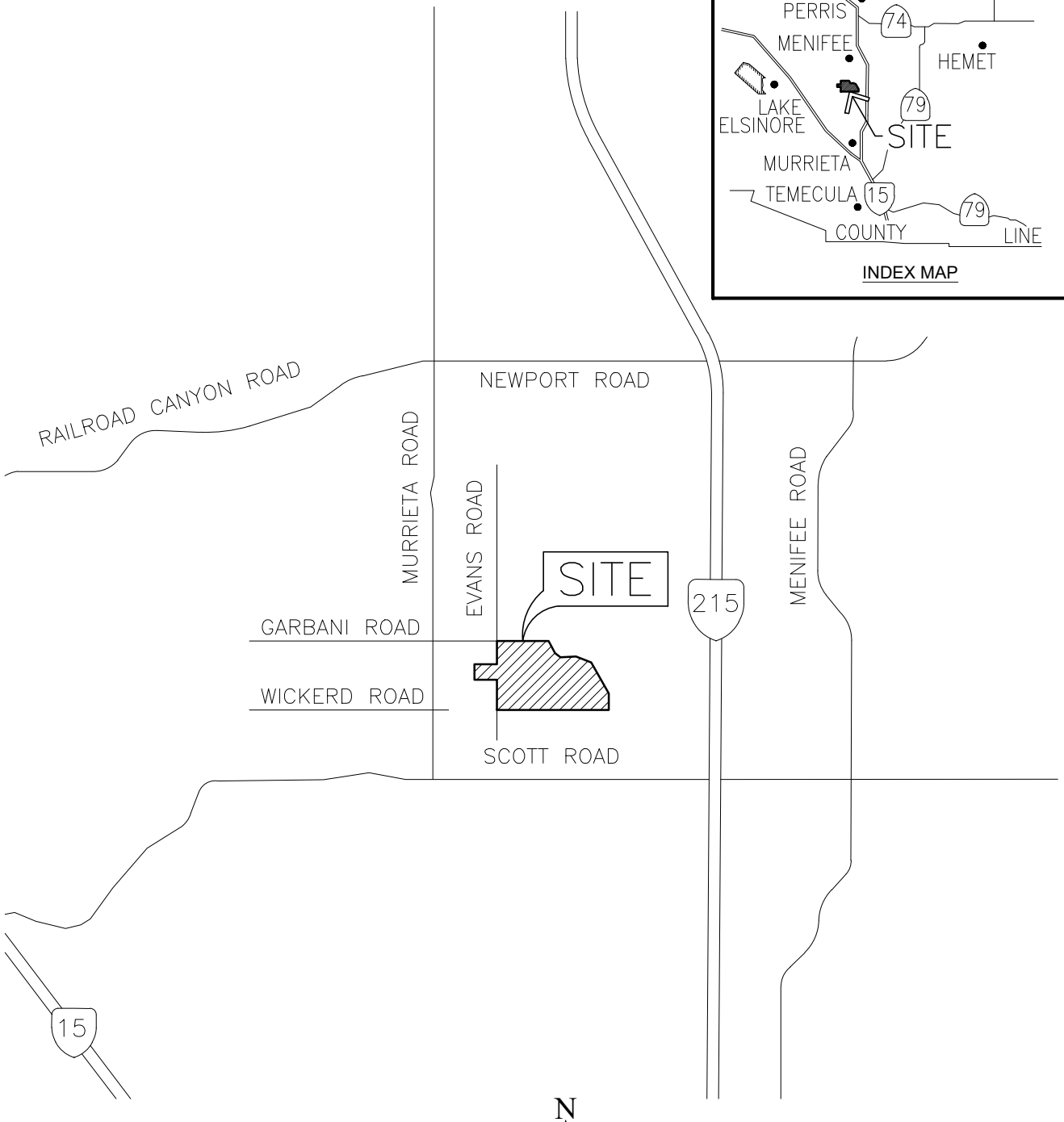
Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map



INDEX MAP



NOT TO SCALE

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FIGURE 1: VICINITY MAP

THOMAS BROTHERS MAPS:
PAGE 868, GRID B-6, B-7, C-6, C-7, D-6 & D-7

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FIGURE 2: AERIAL PHOTOGRAPH

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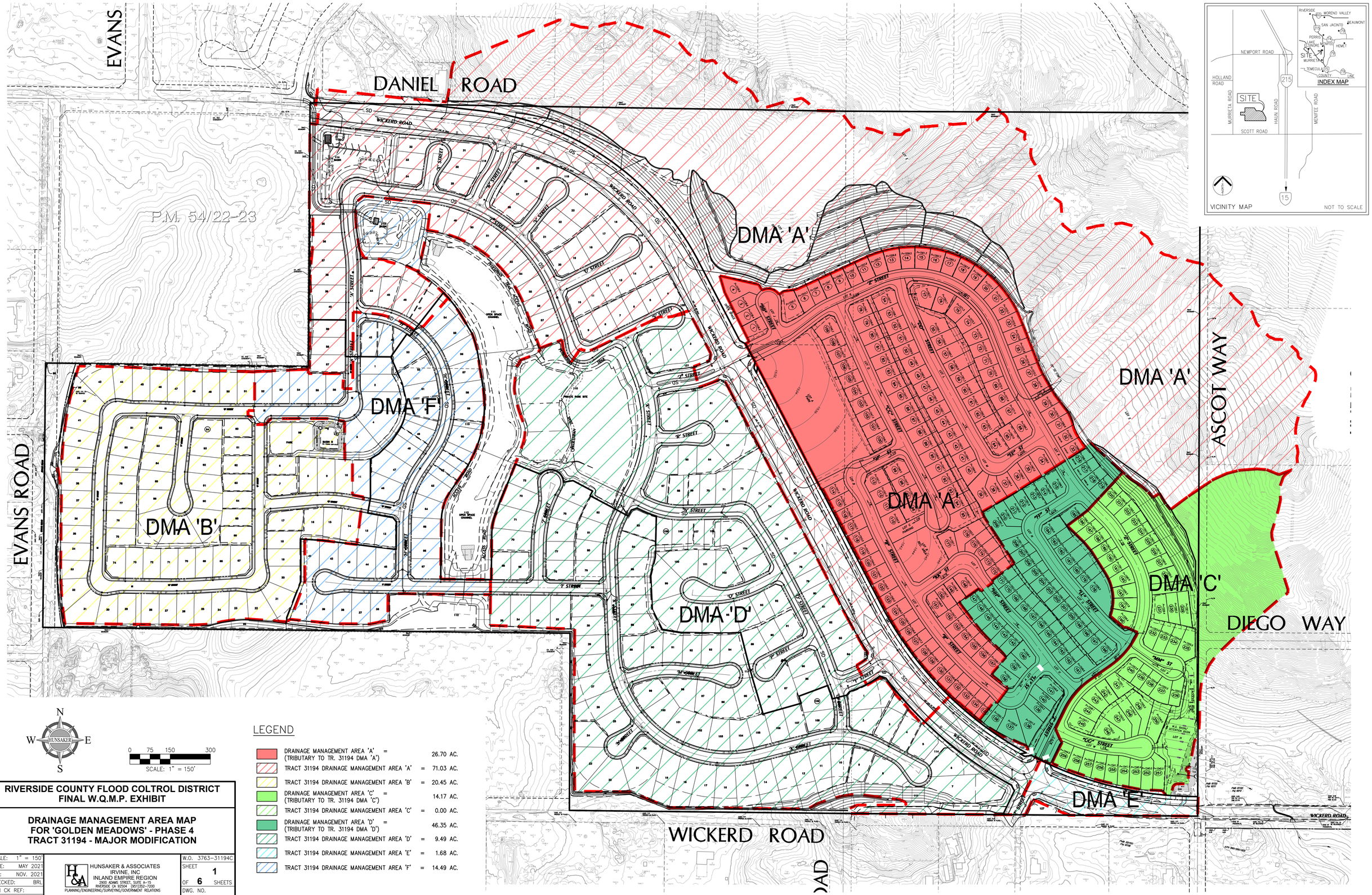

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0 75 150 300
SCALE: 1" = 150'

LEGEND

DRAINAGE MANAGEMENT AREA 'A' = (TRIBUTARY TO TR. 31194 DMA 'A')	26.70	AC.
TRACT 31194 DRAINAGE MANAGEMENT AREA 'A' =	71.03	AC.
TRACT 31194 DRAINAGE MANAGEMENT AREA 'B' =	20.45	AC.
DRAINAGE MANAGEMENT AREA 'C' = (TRIBUTARY TO TR. 31194 DMA 'C')	14.17	AC.
TRACT 31194 DRAINAGE MANAGEMENT AREA 'C' =	0.00	AC.
DRAINAGE MANAGEMENT AREA 'D' = (TRIBUTARY TO TR. 31194 DMA 'D')	46.35	AC.
TRACT 31194 DRAINAGE MANAGEMENT AREA 'D' =	9.49	AC.
TRACT 31194 DRAINAGE MANAGEMENT AREA 'E' =	1.68	AC.
TRACT 31194 DRAINAGE MANAGEMENT AREA 'F' =	14.49	AC.

RIVERSIDE COUNTY FLOOD COLTROL DISTRICT
FINAL W.Q.M.P. EXHIBIT

DRAINAGE MANAGEMENT AREA MAP FOR 'GOLDEN MEADOWS' - PHASE 4 TRACT 31194 - MAJOR MODIFICATION

SCALE:	1" = 150'
DATE:	MAY 2021
REV:	NOV. 2021
CHECKED:	BRL
PLN CK REF:	
F.B.	

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OF	6 SHEETS
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DANIEL ROAD

WICKERD ROAD

'A' STREET

'B' STREET

'C' STREET

'D' STREET

'E' STREET

'F' STREET

'G' STREET

'H' STREET

'I' STREET

'J' STREET

'K' STREET

'L' STREET

'M' STREET

'N' STREET

'O' STREET

'P' STREET

'Q' STREET

'R' STREET

'S' STREET

'T' STREET

'U' STREET

'V' STREET

'W' STREET

'X' STREET

'Y' STREET

'Z' STREET

'AA' STREET

'BB' STREET

'CC' STREET

'DD' STREET

'EE' STREET

'FF' ST

'GG' STREET

'HH' STREET

'II' ST

'JJ' ST

'KK' ST

'LL' ST

'MM' ST

ASCOT WAY

DIEGO WA

LOT A OPEN SPACE

LOT B OPEN SPACE

LOT C OPEN SPACE

LOT D OPEN SPACE

LOT E OPEN SPACE

LOT F OPEN SPACE

LOT G OPEN SPACE

LOT H OPEN SPACE

LOT I OPEN SPACE

LOT J OPEN SPACE

LOT K OPEN SPACE

LOT L OPEN SPACE

LOT M OPEN SPACE

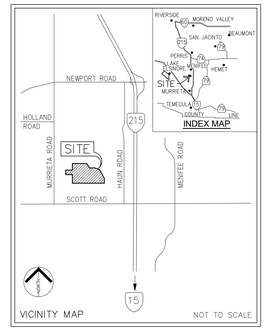
LOT N OPEN SPACE

111 OPEN SPACE CHANNEL

110 PRIVATE PARK SITE

W.Q. BASIN/ DETENTION BASIN

W.Q. POCKING



LID PRACTICES TO BE IMPLEMENTED FOR THIS PROJECT INCLUDE:

- IMPERVIOUS AREA DISPERSION (HSC-2)
- BIORETENTION WITH NO UNDER DRAIN (INF-3)
- STREET TREES (HSC-3)

SITE DESIGN AND SOURCE CONTROL BMP'S INCLUDE:

- INTEGRATED PEST MANAGEMENT (IPM) MEASURES
- SD-10 SITE DESIGN/LANDSCAPE PLANNING
- SD-11 ROOF RUNOFF CONTROLS
- SD-12 EFFICIENT IRRIGATION
- SD-13 STORM DRAIN SIGNAGE
- FIRE SPRINKLERS DRAIN TO PRIMED P-TRAP SANITARY SEWER
- SECONDARY CONTAINMENT FOR ANY ROOF AIR CONDITIONING UNITS

ADDITIONAL STRUCTURAL AND NONSTRUCTURAL SOURCE CONTROL BMP'S (SEE PROJECT WQMP OPERATIONS AND MAINTENANCE PLAN FOR DETAILS):

- EDUCATION FOR TENANTS AND EMPLOYEES
- ACTIVITY RESTRICTIONS
- LANDSCAPE MANAGEMENT
- BMP MAINTENANCE
- TITLE 22 COMPLIANCE
- SPILL CONTINGENCY PLAN
- HAZARDOUS MATERIALS DISCLOSURE COMPLIANCE
- UNIFORM FIRE CODE IMPLEMENTATION
- PEAK STORM FLOW MITIGATION
- PRIVATE STREETS AND PARKING LOTS STREET SWEEPING
- DESIGN AND CONSTRUCT TRASH AND WASTE STORAGE AREAS
- EFFICIENT IRRIGATION SYSTEM AND LANDSCAPE DESIGN
- PROTECTION OF SLOPES AND CHANNELS
- AT GRADE LOADING DOCKS/DELIVERY AREAS
- LITTER CONTROL

LEGEND

- PROJECT BOUNDARY
- PROPOSED DRAINAGE BOUNDARY LINE
- DMA BOUNDARY
- NAP — NOT A PART
- PROPOSED STORM DRAIN & FLOW DIRECTION (ONSITE)
- BYPASS STORM DRAIN & FLOW DIRECTION (PUBLIC)
- DIRECTION OF SURFACE FLOW (ONSITE)
- DIRECTION OF SURFACE FLOW (OFFSITE)
- BUILDINGS
- LANDSCAPED SLOPES WITH BMPS SITE DESIGN/LANDSCAPE PLANNING SD-10 EFFICIENT IRRIGATION SD-12
- OPEN SPACE AREA
- INFILTRATION / WATER QUALITY BASIN
- PAVED AREA WITH STREET SWEEPING BMP
- CONCRETE SIDEWALK
- UNCHANGED PORTION OF ORIGINAL DMA SEE APPROVED WQMP FOR TRACT 31194
- CATCH BASIN WITH WATER QUALITY INSERT

ACREAGE SUMMARY:

	AREA
IMPERVIOUS AREAS	
– BUILDINGS (PROPOSED)	= 6.84 AC
– DRIVEWAYS	= 1.09 AC
– STREETS	= 4.58 AC
– SIDEWALKS	= 1.40 AC
SUB-TOTAL	= 13.91 AC
PERVIOUS AREAS	
– LANDSCAPE SLOPES	= 1.24 AC
– STREET LANDSCAPE	= 0.94 AC
– RESIDENTIAL LANDSCAPE	= 7.39 AC
– DETENTION & W.Q. BASIN BOTTOM	= 0.00 AC
– PARK / OPEN SPACE	= 3.21 AC
SUB-TOTAL	= 12.91 AC
TOTAL SITE AREA	= 26.70 AC

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0 50 100 200

SCALE: 1" = 100'

RIVERSIDE COUNTY FLOOD COLTROL DISTRICT
W.Q.M.P. EXHIBIT

DRAINAGE MANAGEMENT AREA MAP
FOR 'GOLDEN MEADOWS' - PHASE 4
TRACT 31194 - MAJOR MODIFICATION
DRAINAGE MANAGEMENT AREA 'A'

SCALE:	1" = 100'
DATE:	MAY 2021
REV:	NOV. 2021
CHECKED:	BRL
PLN CK REF:	
F.B.	

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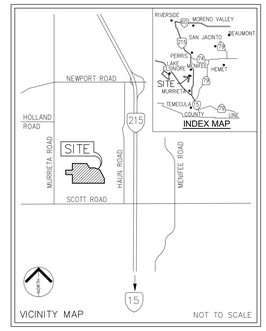
DANIEL ROAD

ASCOT WAY

DIEGO WA



LID PRACTICES TO BE IMPLEMENTED FOR THIS PROJECT INCLUDE:

- IMPERVIOUS AREA DISPERSION (HSC-2)
- BIORETENTION WITH NO UNDER DRAIN (INF-3)
- STREET TREES (HSC-3)

SITE DESIGN AND SOURCE CONTROL BMP'S INCLUDE:

- INTEGRATED PEST MANAGEMENT (IPM) MEASURES
- SD-10 SITE DESIGN/LANDSCAPE PLANNING
- SD-11 ROOF RUNOFF CONTROLS
- SD-12 EFFICIENT IRRIGATION
- SD-13 STORM DRAIN SIGNAGE
- FIRE SPRINKLERS DRAIN TO PRIMED P-TRAP SANITARY SEWER
- SECONDARY CONTAINMENT FOR ANY ROOF AIR CONDITIONING UNITS

ADDITIONAL STRUCTURAL AND NONSTRUCTURAL SOURCE CONTROL BMP'S (SEE PROJECT WQMP OPERATIONS AND MAINTENANCE PLAN FOR DETAILS):

- EDUCATION FOR TENANTS AND EMPLOYEES
- ACTIVITY RESTRICTIONS
- LANDSCAPE MANAGEMENT
- BMP MAINTENANCE
- TITLE 22 COMPLIANCE
- SPILL CONTINGENCY PLAN
- HAZARDOUS MATERIALS DISCLOSURE COMPLIANCE
- UNIFORM FIRE CODE IMPLEMENTATION
- PEAK STORM FLOW MITIGATION
- PRIVATE STREETS AND PARKING LOTS STREET SWEEPING
- DESIGN AND CONSTRUCT TRASH AND WASTE STORAGE AREAS
- EFFICIENT IRRIGATION SYSTEM AND LANDSCAPE DESIGN
- PROTECTION OF SLOPES AND CHANNELS
- AT GRADE LOADING DOCKS/DELIVERY AREAS
- LITTER CONTROL

LEGEND

- PROJECT BOUNDARY
- PROPOSED DRAINAGE BOUNDARY LINE
- DMA BOUNDARY
- NAP — NOT A PART
- PROPOSED STORM DRAIN & FLOW DIRECTION (ONSITE)
- BYPASS STORM DRAIN & FLOW DIRECTION (PUBLIC)
- DIRECTION OF SURFACE FLOW (ONSITE)
- DIRECTION OF SURFACE FLOW (OFFSITE)

- BUILDINGS
- LANDSCAPED SLOPES WITH BMPS SITE DESIGN/LANDSCAPE PLANNING SD-10 EFFICIENT IRRIGATION SD-12
- OPEN SPACE AREA
- INFILTRATION / WATER QUALITY BASIN
- PAVED AREA WITH STREET SWEEPING BMP
- CONCRETE SIDEWALK
- UNCHANGED PORTION OF ORIGINAL DMA SEE APPROVED WQMP FOR TRACT 31194
- DECOMPOSED GRANITE ACCESS ROAD
- NATURAL AREA
- CATCH BASIN WITH WATER QUALITY INSERT

ACREAGE SUMMARY:

	AREA
IMPERVIOUS AREAS	
– BUILDINGS (PROPOSED)	= 9.46 AC
– DRIVEWAYS	= 1.51 AC
– STREETS	= 15.13 AC
– SIDEWALKS	= 3.23 AC
SUB-TOTAL	= 29.33 AC
PERVIOUS AREAS	
– LANDSCAPE SLOPES	= 9.73 AC
– STREET LANDSCAPE	= 3.70 AC
– RESIDENTIAL LANDSCAPE	= 17.61 AC
– DETENTION & W.Q. BASIN BOTTOM	= 0.72 AC
– PARK / OPEN SPACE	= 3.21 AC
– D.G. ROAD/TRAIL	= 0.75 AC
– NATURAL / UNDISTURBED	= 32.81 AC
SUB-TOTAL	= 68.54 AC
TOTAL SITE AREA	= 97.86 AC

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0 50 100 200
SCALE: 1" = 100'

RIVERSIDE COUNTY FLOOD COLTROL DISTRICT
W.Q.M.P. EXHIBIT

DRAINAGE MANAGEMENT AREA MAP
FOR 'GOLDEN MEADOWS' - PHASE 4
TRACT 31194 - MAJOR MODIFICATION
DRAINAGE MANAGEMENT AREA 'A' - OVERALL

SCALE:	1" = 100'
DATE:	MAY 2021
REV:	NOV. 2021
CHECKED:	BRL
PLN CK REF:	
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ADDITIONAL STRUCTURAL AND NONSTRUCTURAL SOURCE CONTROL BMP'S (SEE PROJECT WQMP OPERATIONS AND MAINTENANCE PLAN FOR DETAILS):

- EDUCATION FOR TENANTS AND EMPLOYEES
- ACTIVITY RESTRICTIONS
- LANDSCAPE MANAGEMENT
- BMP MAINTENANCE
- TITLE 22 COMPLIANCE
- SPILL CONTINGENCY PLAN
- HAZARDOUS MATERIALS DISCLOSURE COMPLIANCE
- UNIFORM FIRE CODE IMPLEMENTATION
- PEAK STORM FLOW MITIGATION
- PRIVATE STREETS AND PARKING LOTS STREET SWEEPING
- DESIGN AND CONSTRUCT TRASH AND WASTE STORAGE AREAS
- EFFICIENT IRRIGATION SYSTEM AND LANDSCAPE DESIGN
- PROTECTION OF SLOPES AND CHANNELS
- AT GRADE LOADING DOCKS/DELIVERY AREAS
- LITTER CONTROL

LID PRACTICES TO BE IMPLEMENTED FOR THIS PROJECT INCLUDE:

- IMPERVIOUS AREA DISPERSION (HSC-2)
- BIORETENTION WITH NO UNDER DRAIN (INF-3)
- STREET TREES (HSC-3)

SITE DESIGN AND SOURCE CONTROL BMP'S INCLUDE:

- INTEGRATED PEST MANAGEMENT (IPM) MEASURES
- SD-10 SITE DESIGN/LANDSCAPE PLANNING
- SD-11 ROOF RUNOFF CONTROLS
- SD-12 EFFICIENT IRRIGATION
- SD-13 STORM DRAIN SIGNAGE
- FIRE SPRINKLERS DRAIN TO PRIMED P-TRAP SANITARY SEWER
- SECONDARY CONTAINMENT FOR ANY ROOF AIR CONDITIONING UNITS

LEGEND

- PROJECT BOUNDARY
- PROPOSED DRAINAGE BOUNDARY LINE
- DMA BOUNDARY
- NAP — NOT A PART
- PROPOSED STORM DRAIN & FLOW DIRECTION (ONSITE)
- BYPASS STORM DRAIN & FLOW DIRECTION (PUBLIC)
- DIRECTION OF SURFACE FLOW (ONSITE)
- DIRECTION OF SURFACE FLOW (OFFSITE)
- BUILDINGS
- LANDSCAPED SLOPES WITH BMPS SITE DESIGN/LANDSCAPE PLANNING SD-10 EFFICIENT IRRIGATION SD-12
- OPEN SPACE AREA
- INFILTRATION / WATER QUALITY BASIN
- PAVED AREA WITH STREET SWEEPING BMP
- CONCRETE SIDEWALK
- DECOMPOSED GRANITE ACCESS ROAD
- NATURAL AREA
- UNCHANGED PORTION OF ORIGINAL DMA SEE APPROVED WQMP FOR TRACT 31194
- CATCH BASIN WITH WATER QUALITY INSERT

ACREAGE SUMMARY:

		AREA
IMPERVIOUS AREAS		
– BUILDINGS (PROPOSED)	=	2.30 AC
– DRIVEWAYS	=	0.37 AC
– STREETS	=	1.23 AC
– SIDEWALKS	=	0.37 AC
SUB-TOTAL	=	4.26 AC
PERVIOUS AREAS		
– LANDSCAPE SLOPES	=	1.60 AC
– STREET LANDSCAPE	=	0.24 AC
– RESIDENTIAL LANDSCAPE	=	3.01 AC
– DECOMPOSED GRANITE ACCESS ROAD	=	0.15 AC
– DETENTION & W.Q. BASIN BOTTOM	=	0.36 AC
– NATURAL / OPEN SPACE	=	4.55 AC
SUB-TOTAL	=	9.91 AC
TOTAL SITE AREA	=	14.17 AC

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SCALE: 1" = 60'

RIVERSIDE COUNTY FLOOD COLTROL DISTRICT
W.Q.M.P. EXHIBIT

DRAINAGE MANAGEMENT AREA MAP
FOR 'GOLDEN MEADOWS' - PHASE 4
TRACT 31194 - MAJOR MODIFICATION
DRAINAGE MANAGEMENT AREA 'C'

SCALE:	1" = 60'
DATE:	MAY 2021
REV:	NOV. 2021
CHECKED:	BRL
PLN CK REF:	
F.B.	

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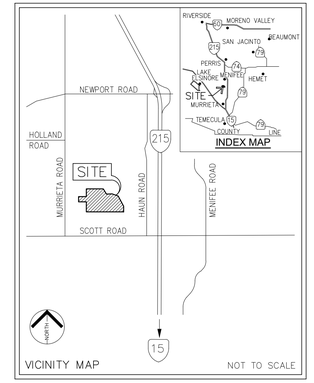

ADDITIONAL STRUCTURAL AND NONSTRUCTURAL SOURCE CONTROL BMP'S (SEE PROJECT WQMP OPERATIONS AND MAINTENANCE PLAN FOR DETAILS):

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- ACTIVITY RESTRICTIONS
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- SPILL CONTINGENCY PLAN
- HAZARDOUS MATERIALS DISCLOSURE COMPLIANCE
- UNIFORM FIRE CODE IMPLEMENTATION
- PEAK STORM FLOW MITIGATION
- PRIVATE STREETS AND PARKING LOTS STREET SWEEPING
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- PROTECTION OF SLOPES AND CHANNELS
- AT GRADE LOADING DOCKS/DELIVERY AREAS
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LID PRACTICES TO BE IMPLEMENTED FOR THIS PROJECT INCLUDE:

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- STREET TREES (HSC-3)

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- SD-12 EFFICIENT IRRIGATION
- SD-13 STORM DRAIN SIGNAGE
- FIRE SPRINKLERS DRAIN TO PRIMED P-TRAP SANITARY SEWER
- SECONDARY CONTAINMENT FOR ANY ROOF AIR CONDITIONING UNITS

LEGEND

- PROJECT BOUNDARY
- PROPOSED DRAINAGE BOUNDARY LINE
- DMA BOUNDARY
- NAP — NOT A PART
- PROPOSED STORM DRAIN & FLOW DIRECTION (ONSITE)
- BYPASS STORM DRAIN & FLOW DIRECTION (PUBLIC)
- DIRECTION OF SURFACE FLOW (ONSITE)
- DIRECTION OF SURFACE FLOW (OFFSITE)
- BUILDINGS
- LANDSCAPED SLOPES WITH BMPS — SITE DESIGN/LANDSCAPE PLANNING SD-10, EFFICIENT IRRIGATION SD-12
- OPEN SPACE AREA
- INFILTRATION / WATER QUALITY BASIN
- PAVED AREA WITH STREET SWEEPING BMP
- CONCRETE SIDEWALK
- UNCHANGED PORTION OF ORIGINAL DMA — SEE APPROVED WQMP FOR TRACT 31194
- CATCH BASIN WITH WATER QUALITY INSERT

ACREAGE SUMMARY:		AREA
IMPERVIOUS AREAS		
– BUILDINGS (PROPOSED)	=	2.85 AC.
– DRIVEWAYS	=	0.46 AC.
– STREETS	=	1.89 AC.
– SIDEWALKS	=	0.56 AC.
SUB-TOTAL	=	5.76 AC.
PERVIOUS AREAS		
– LANDSCAPE SLOPES	=	0.50 AC.
– STREET LANDSCAPE	=	0.39 AC.
– RESIDENTIAL LANDSCAPE	=	2.85 AC.
– DETENTION & W.Q. BASIN BOTTOM	=	0.00 AC.
– NATURAL / OPEN SPACE	=	0.00 AC.
SUB-TOTAL	=	3.73 AC.
TOTAL SITE AREA	=	9.49 AC.

N W E S HUNSAKER

0 50 100 200
SCALE: 1" = 100'

RIVERSIDE COUNTY FLOOD COLTROL DISTRICT
W.Q.M.P. EXHIBIT

DRAINAGE MANAGEMENT AREA MAP
FOR 'GOLDEN MEADOWS' - PHASE 4
TRACT 31194 - MAJOR MODIFICATION
DRAINAGE MANAGEMENT AREA 'D'

SCALE:	1" = 100'
DATE:	MAY 2021
REV:	NOV. 2021
CHECKED:	BRL
PLN CK REF:	
F.B.	

HUNSAKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

W.O. 3763-31194
SHEET 5
OF 6 SHEETS
DWG. NO.

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ADDITIONAL STRUCTURAL AND NONSTRUCTURAL SOURCE CONTROL BMP'S (SEE PROJECT WQMP OPERATIONS AND MAINTENANCE PLAN FOR DETAILS):

- EDUCATION FOR TENANTS AND EMPLOYEES
- ACTIVITY RESTRICTIONS
- LANDSCAPE MANAGEMENT
- BMP MAINTENANCE
- TITLE 22 COMPLIANCE
- SPILL CONTINGENCY PLAN
- HAZARDOUS MATERIALS DISCLOSURE COMPLIANCE
- UNIFORM FIRE CODE IMPLEMENTATION
- PEAK STORM FLOW MITIGATION
- PRIVATE STREETS AND PARKING LOTS STREET SWEEPING
- DESIGN AND CONSTRUCT TRASH AND WASTE STORAGE AREAS
- EFFICIENT IRRIGATION SYSTEM AND LANDSCAPE DESIGN
- PROTECTION OF SLOPES AND CHANNELS
- AT GRADE LOADING DOCKS/DELIVERY AREAS
- LITTER CONTROL

LID PRACTICES TO BE IMPLEMENTED FOR THIS PROJECT INCLUDE:

- IMPERVIOUS AREA DISPERSION (HSC-2)
- BIORETENTION WITH NO UNDER DRAIN (INF-3)
- STREET TREES (HSC-3)

SITE DESIGN AND SOURCE CONTROL BMP'S INCLUDE:

- INTEGRATED PEST MANAGEMENT (IPM) MEASURES
- SD-10 SITE DESIGN/LANDSCAPE PLANNING
- SD-11 ROOF RUNOFF CONTROLS
- SD-12 EFFICIENT IRRIGATION
- SD-13 STORM DRAIN SIGNAGE
- FIRE SPRINKLERS DRAIN TO PRIMED P-TRAP SANITARY SEWER
- SECONDARY CONTAINMENT FOR ANY ROOF AIR CONDITIONING UNITS

LEGEND

- PROJECT BOUNDARY
- PROPOSED DRAINAGE BOUNDARY LINE
- DMA BOUNDARY
- NAP — NOT A PART
- PROPOSED STORM DRAIN & FLOW DIRECTION (ONSITE)
- BYPASS STORM DRAIN & FLOW DIRECTION (PUBLIC)
- DIRECTION OF SURFACE FLOW (ONSITE)
- DIRECTION OF SURFACE FLOW (OFFSITE)
- BUILDINGS
- LANDSCAPED SLOPES WITH BMPS SITE DESIGN/LANDSCAPE PLANNING SD-10 EFFICIENT IRRIGATION SD-12
- OPEN SPACE AREA
- INFILTRATION / WATER QUALITY BASIN
- PAVED AREA WITH STREET SWEEPING BMP
- CONCRETE SIDEWALK
- UNCHANGED PORTION OF ORIGINAL DMA SEE APPROVED WQMP FOR TRACT 31194
- DECOMPOSED GRANITE ACCESS ROAD
- NATURAL AREA
- CATCH BASIN WITH WATER QUALITY INSERT

ACREAGE SUMMARY:

	AREA
IMPERVIOUS AREAS	
– BUILDINGS (PROPOSED)	= 8.68 AC.
– DRIVEWAYS	= 1.39 AC.
– STREETS	= 9.09 AC.
– SIDEWALKS	= 2.58 AC.
SUB-TOTAL	=21.73 AC.
PERVIOUS AREAS	
– LANDSCAPE SLOPES	= 3.15 AC.
– STREET LANDSCAPE	= 1.92 AC.
– RESIDENTIAL LANDSCAPE	= 25.22 AC.
– DETENTION & W.Q. BASIN BOTTOM	= 1.29 AC.
– OPEN SPACE	= 2.47 AC.
– D.G. ACCESS ROAD	= 0.06 AC.
SUB-TOTAL	=34.10 AC.
TOTAL SITE AREA	=55.84 AC.

N / W HUNSAKER E / S

0 50 100 200

SCALE: 1" = 100'

INDEX MAP

VICINITY MAP — NOT TO SCALE

WICKERD ROAD

RIVERSIDE COUNTY FLOOD COLTROL DISTRICT
W.Q.M.P. EXHIBIT

DRAINAGE MANAGEMENT AREA MAP
FOR 'GOLDEN MEADOWS' - PHASE 4
TRACT 31194 - MAJOR MODIFICATION
DRAINAGE MANAGEMENT AREA 'D' - OVERALL

SCALE:	1" = 100'
DATE:	MAY 2021
REV:	NOV. 2021
CHECKED:	BRL
PLN CK REF:	
F.B.	

HUNSAKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
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W.O. 3763-31194
SHEET 6
OF 6 SHEETS
DWG. NO.

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Appendix 2: Construction Plans

Grading and Drainage Plans

MAJOR MODIFICATION FOR GOLDEN MEADOWS TRACT NO. 31194 PHASE 4

LOT SUMMARY TABLE

Lot	Land Use	Acreage
1–259	RESIDENTIAL LOTS	28.0
A	PARK	2.95
B	RECREATION CENTER	0.6
C	ACCESS ROAD/PARKING	0.15
D	DRAINAGE EASEMENT	0.04
E–G	OPEN SPACE	41.3
H	WATER QUALITY BASIN	1.2
I	PRIVATE ROAD	0.11
	PUBLIC STREETS	11.6
TOTAL		86.06

OWNER

RICHLAND PLANNED COMMUNITIES, INC
3161 MICHELSON DRIVE
SUITE 425
IRVINE, CA 92612
TEL: (949) 858–4980
BRIAN HARDY
BHARDY@RICHLANDCOMMUNITIES.COM

APPLICANT

RICHLAND COMMUNITIES
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IRVINE, CA 92612
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2900 ADAMS STREET, SUITE A–15
RIVERSIDE, CA 92504
TEL: (951) 509–7047
DANIELLE S. FREGOSO, PE
DFREGOSO@HUNSAKER.COM

GRADING QUANTITIES

GRADED AREA ______ 177.2 ACRES
CUT QUANTITIES ______ 793,000 CYD
FILL QUANTITIES ______ 793,000 CYD
IMPORT/EXPORT ______ 0 CYD

ASSESSORS PARCEL NUMBER

360–300–002, 360–300–003, 360–300–006 AND 360–350–001

LEGAL DESCRIPTION

PARCEL A:
PARCELS 2,3,5,6 AND 8, TOGETHER WITH LOTS B THROUGH F, ALL AS SHOWN BY PARCEL MAP NO. 8433, ON FILE IN BOOK 38 PAGE 33 OF PARCEL MAPS, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.
PARCEL B:
THE WEST HALF OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 6 SOUTH, RANGE 3 WEST, SAN BERNARDINO BASE AND MERIDIAN.

TOPOGRAPHY SOURCE

R.J. LUNG & ASSOCIATES
2832 WALNUT, SUITE E
TUSTIN, CA 92780
(714) 832–2077
COMPILED BY PHOTOGRAMMETRIC METHODS.
CONTOURS WERE STREAM DIGITIZED.
FLOWN DEC., 2002

VICINITY MAP
SECTION 15, T6S, R3W S.B.B.&M

NOTES

1 EXISTING ZONING: PDO–5
2. PROPOSED LAND USE: SINGLE FAMILY RESIDENTIAL
3. GENERAL PLAN LAND USE DESIGNATION: 2.1–5 DU/AC RESIDENTIAL (2.1–5R)
4. EXISTING LAND USE: VACANT LAND
5. DENSITY CALCULATION
 5.1. EXISTING: 156 DU/86.06 AC = 1.81 DU/AC
 5.2. PROPOSED: 259 DU/86.06 AC = 3.0 DU/AC
 5.3. OVERALL: 571 DU/206.8 AC = 2.8 DU/AC
6. ADJACENT LAND USES:
 a. NORTH: RESIDENTIAL (RR5)/VACANT
 b. SOUTH: RESIDENTIAL (RR1)/VACANT
 c. EAST: RESIDENTIAL (RR5)/VACANT
 d. WEST: RESIDENTIAL (PDO–5)/VACANT
7. TOTAL GROSS AREA: 86.06 AC
8. TOTAL NET AREA: 59.26 AC
9. TOTAL LOTS: 269 (260 SFD RESIDENTIAL, 1 PARK, 1 REC. CENTER, 2 ACCESS, 1 DRAINAGE, 1 BASIN, 3 OPEN SPACE)
10. AVERAGE RESIDENTIAL LOT SIZE: 4,738 SF (50'X80'), 4,657 SF (42'X90')
11. MINIMUM RESIDENTIAL LOT SIZE: 4,000 SF (50'X80'), 3,780 SF (42'X90')
21. A PORTION OF THE PROJECT SITE IS IN A HIGH FIRE HAZARD ZONE, PER THE CITY OF MENIFEE HIGH FIRE HAZARD AREA EXHIBIT S–6.
22. PHASE 4 IS NOT WITHIN ANY WETLANDS.
23. THE PROJECT WILL ANNEX INTO THE CITYWIDE CFD
24. THE PROJECT IS NOT KNOWN TO BE WITHIN A HAZARDOUS WASTE SITE
25. THE PROJECT IS NOT SUBJECT TO LIQUEFACTION OR OTHER GEOLOGIC HAZARDS
34. THE PROJECT SITE IS NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD. PER FLOOD INSURANCE RATE MAP NUMBER 06065C2070H, PANEL 2070 OF 3805, MAP REVISED AUGUST 18, 2014.
35. THE PROJECT IS NOT WITHIN A FAULT ZONE AND NOT WITHIN ½ MILE OF A FAULT.
36. THE PROJECT IS NOT KNOWN TO CONTAIN CULTURAL RESOURCES
37. ALL SLOPES SHALL BE CONSTRUCTED AT 2:1 UNLESS OTHERWISE NOTED.
38. DRAINAGE IMPROVEMENTS SHALL BE DESIGNED PER RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT STANDARD DRAWINGS
39. STREET IMPROVEMENTS SHALL BE DESIGNED PER CITY ROAD IMPROVEMENT STANDARDS & SPECIFICATIONS AND THE COUNTYWIDE DESIGN STANDARDS GUIDELINES.
40. THE TENTATIVE TRACT MAP BOUNDARY CONTAINS THE ENTIRE CONTIGUOUS OWNERSHIP OF THE LAND DIVIDER
41. THOMAS GUIDE: PAGE 868 7C & D RIVERSIDE COUNTY (2003 ED.)
42. THE PROJECT SITE IS WITHIN THE SAN JACINTO VALLEY WATERSHED.

LOT SUMMARY TABLE

RESIDENTIAL LOTS
1 THRU 259

LOT NO.	GROSS SQ.FT	NET SQ.FT	AVG. WIDTH	AVG. DEPTH	LOT NO.	GROSS SQ.FT	NET SQ.FT	AVG. WIDTH	AVG. DEPTH	LOT NO.	GROSS SQ.FT	NET SQ.FT	AVG. WIDTH	AVG. DEPTH
1	5,380.0	4,167.8	50.7	83.8	89	5,225.2	4,000.0	50.0	80.0	177	5,004.4	5,004.4	54.2	90.3
2	4,129.8	4,129.8	50.0	82.4	90	5,250.5	4,000.0	50.0	80.0	178	10,524.6	8,746.4	117.6	87.0
3	4,618.1	4,618.1	50.0	91.8	91	5,275.7	4,000.0	50.0	80.0	179	4,341.1	3,713.2	42.0	103.6
4	8,036.5	8,036.5	55.4	140.5	92	5,302.9	4,000.0	50.0	80.0	180	4,594.8	3,964.4	42.0	109.3
5	7,624.7	5,280.5	53.6	107.0	93	5,383.9	4,000.0	50.0	80.0	181	4,939.9	4,282.4	44.7	110.4
6	4,446.8	4,446.8	50.0	88.9	94	5,572.0	4,001.8	50.0	80.0	182	4,641.2	4,036.9	44.4	104.3
7	4,066.4	3,906.4	48.0	81.0	95	8,435.1	4,797.6	52.0	94.1	183	3,993.9	3,619.8	42.1	95.2
8	4,006.7	3,846.7	48.1	80.0	96	5,387.5	4,826.6	61.0	90.1	184	4,849.5	4,620.3	55.8	89.4
9	4,000.0	3,840.0	48.0	80.0	97	4,078.7	4,078.7	51.0	80.0	185	4,444.3	4,261.5	49.3	92.3
10	4,000.0	3,840.0	48.0	80.0	98	4,000.0	4,000.0	50.0	80.0	186	3,983.7	3,983.7	42.0	94.5
11	4,056.3	3,896.3	48.7	80.0	99	5,095.8	4,312.2	56.1	80.0	187	3,949.6	3,949.6	42.0	93.8
12	4,458.5	4,298.5	53.5	80.0	100	4,918.1	4,217.9	50.2	85.3	188	4,108.6	4,108.6	44.5	92.8
13	4,458.5	4,298.5	53.5	80.0	101	4,207.2	4,209.2	50.0	84.2	189	3,782.5	3,782.5	42.0	90.0
14	4,330.2	4,170.2	52.0	80.0	102	4,130.6	4,130.6	50.0	82.6	190	3,780.0	3,780.0	42.0	90.0
15	4,286.7	4,126.7	51.4	80.0	103	4,147.8	4,147.8	51.4	80.6	191	3,783.6	3,783.6	42.0	90.0
16	4,274.7	4,114.7	51.3	80.0	104	4,089.3	4,089.3	51.1	79.9	192	4,583.0	4,583.0	50.8	90.1
17	4,274.7	4,114.7	51.4	80.0	105	4,000.0	4,000.0	50.0	80.0	193	4,311.5	4,311.5	47.8	90.0
18	4,274.7	4,114.7	51.4	80.0	106	4,000.0	4,000.0	50.0	80.0	194	4,286.9	4,286.9	47.5	90.0
19	4,274.8	4,114.8	51.4	80.0	107	4,000.0	4,000.0	50.0	80.0	195	5,391.5	4,952.1	59.5	90.1
20	4,274.8	4,274.8	53.3	80.0	108	4,000.0	4,000.0	50.0	80.0	196	5,831.3	4,994.8	58.8	102.1
21	4,274.8	4,274.8	53.3	80.0	109	6,192.4	4,818.5	58.9	86.9	197	3,985.1	3,985.1	42.0	93.3
22	4,274.8	4,274.8	53.3	80.0	110	5,088.5	4,965.5	61.0	81.3	198	3,818.4	3,818.4	42.0	90.8
23	4,172.2	4,172.2	52.1	80.0	111	4,857.8	4,268.6	51.0	83.9	199	3,780.1	3,780.1	42.0	90.0
24	4,000.0	4,000.0	50.0	80.0	112	4,566.6	4,139.1	50.0	82.6	200	3,780.0	3,780.0	42.0	90.0
25	4,000.0	4,000.0	50.0	80.0	113	5,614.4	4,687.9	58.7	84.8	201	3,780.0	3,780.0	42.0	90.0
26	4,000.0	4,000.0	50.0	80.0	114	4,102.7	4,102.7	50.0	80.5	202	3,780.0	3,780.0	42.0	90.0
27	4,260.4	4,260.4	53.1	80.0	115	4,387.7	4,387.7	50.0	88.0	203	3,817.0	3,817.0	42.3	90.3
28	4,103.2	4,103.2	51.3	80.0	116	4,491.2	4,491.2	50.0	90.0	204	4,012.1	4,012.1	43.8	91.6
29	4,053.8	4,053.8	50.0	80.5	117	4,287.6	4,287.6	50.0	85.9	205	4,082.5	4,082.5	43.8	93.2
30	4,340.3	4,340.3	50.0	86.8	118	4,074.9	4,074.9	50.0	81.3	206	4,141.8	4,141.8	43.7	94.9
31	4,366.5	4,365.2	50.0	87.3	119	4,013.2	4,013.2	50.0	80.3	207	3,872.3	3,872.3	42.1	92.6
32	4,105.4	3,994.6	50.0	78.8	120	4,013.0	4,013.0	50.0	80.0	208	4,312.0	4,312.0	50.2	85.1
33	4,154.0	3,997.1	50.0	79.9	121	4,102.8	4,102.8	51.1	80.3	209	8,154.2	8,154.2	50.0	136.0
34	5,641.1	5,641.1	58.6	98.5	122	4,253.4	4,253.4	52.0	81.8	210	5,688.7	5,688.7	51.0	106.0
35	4,806.1	4,806.1	50.0	96.1	123	4,302.6	4,302.6	50.3	85.5	211	3,987.2	3,987.2	42.0	95.4
36	4,464.4	4,464.4	50.0	89.3	124	4,451.6	4,451.6	50.0	89.1	212	3,832.9	3,832.9	42.0	90.6
37	4,193.6	4,193.6	50.0	83.1	125	4,093.7	4,093.7	45.2	90.7	213	4,022.8	4,022.8	42.0	95.9
38	4,817.3	4,817.3	50.5	104.8	126	4,127.6	4,127.6	45.1	91.6	214	4,006.5	4,006.5	42.0	95.3
39	7,598.6	7,598.6	53.4	153.8	127	4,182.7	4,182.7	45.3	92.4	215	4,523.7	4,523.7	49.7	93.4
40	4,843.4	4,843.4	61.9	77.8	128	4,203.1	4,203.1	45.1	93.1	216	3,811.0	3,811.0	44.8	86.4
41	4,275.9	4,275.9	52.0	83.0	129	4,277.8	4,277.8	45.6	93.8	217	4,021.1	4,021.1	45.0	88.9
42	4,044.4	4,044.4	50.0	80.8	130	4,193.0	4,193.0	44.5	94.3	218	4,065.4	4,065.4	45.0	91.7
43	4,000.6	4,000.6	50.0	80.0	131	4,289.8	4,289.8	45.3	94.8	219	4,022.3	4,022.3	43.7	92.1
44	4,000.0	4,000.0	50.0	80.0	132	4,306.3	4,306.3	45.3	95.1	220	3,839.1	3,839.1	42.0	91.5
45	4,000.0	4,000.0	50.0	80.0	133	4,323.6	4,323.6	45.6	94.8	221	3,945.9	3,861.8	43.8	90.0
46	4,000.0	4,000.0	50.0	80.0	134	4,255.1	4,255.1	44.7	95.3	222	4,301.5	4,217.2	47.8	90.0
47	4,000.0	4,000.0	50.0	80.0	135	4,075.4	4,075.4	45.1	90.8	223	3,989.1	3,904.9	44.3	90.0
48	4,015.6	4,015.6	50.0	80.0	136	4,223.3	4,223.3	48.6	87.4	224	3,780.0	3,696.0	42.0	90.0
49	4,213.7	4,213.7	52.7	80.0	137	8,062.6	8,062.6	74.9	112.4	225	3,794.4	3,710.4	42.0	90.0
50	4,000.0	4,000.0	50.0	80.0	138	7,890.9	7,890.9	69.8	113.5	226	4,321.3	4,237.0	47.8	90.0
51	4,000.0	4,000.0	50.0	80.0	139	4,535.5	4,535.5	44.8	101.3	227	4,580.5	4,496.2	48.3	94.7
52	4,000.0	4,000.0	50.0	80.0	140	4,386.0	4,386.0	42.0	104.4	228	5,525.5	5,441.1	52.4	106.5
53	4,007.5	4,007.5	50.0	80.0	141	5,622.2	4,736.6	47.1	104.0	229	5,463.1	5,463.1	42.0	130.1
54	5,551.2	4,454.2	53.4	83.8	142	3,790.8	3,790.8	42.0	90.0	230	4,858.9	4,858.9	42.0	115.7
55	9,247.0	6,322.5	75.3	90.2	143	3,780.0	3,780.0	42.0	90.0	231	5,651.1	4,505.8	56.2	97.3
56	5,744.1	4,341.0	51.1	85.0	144	4,128.9	4,128.9	45.6	90.7	232	5,270.8	4,394.1	48.8	107.5
57	6,228.6	4,837.1	54.3	89.6	145	4,059.1	4,059.1	45.0	90.7	233	5,038.3	4,443.2	42.0	120.8
58	5,616.7	4,296.9	50.0	85.9	146	3,780.0	3,780.0	42.0	90.0	234	4,965.4	4,348.8	42.0	118.1
59	5,310.6	4,000.0	50.0	80.0	147	3,915.6	3,915.6	43.5	90.0	235	6,640.9	6,196.5	60.3	120.9
60	5,004.9	4,000.0	50.0	80.0	148	4,606.2	4,494.4	54.5	90.0	236	4,292.4	4,290.6	42.0	99.4
61	4,761.1	4,000.0	50.0	80.0	149	3,780.0	3,520.0	42.0	90.0	237	5,553.0	5,553.0	60.8	90.0
62	4,706.4	4,000.0	50.0	80.0	150	3,780.0	3,600.0	42.0	90.0	238	3,780.0	3,780.0	42.0	90.0
63	6,049.9	4,427.8	56.7	79.7	151	4,386.8	3,994.0	50.1	90.0	239	3,780.0	3,780.0	42.0	90.0
64	5,005.7	3,955.6	49.2	83.0	152	4,750.2	4,261.9	47.0	101.1	240	5,269.6	4,580.9	58.8	90.0
65	4,468.2	4,054.2	54.0	82.0	153	4,698.4	4,236.6	46.8	100.6	241	5,362.0	4,732.0	60.5	90.0
66	4,735.6	4,675.6	58.3	82.0	154	4,580.9	4,222.8	46.6	98.3	242	4,009.9	3,829.9	44.5	90.0
67	4,935.9	4,855.8	60.6	80.0	155	4,513.1	4,223.5	46.7	96.6	243	4,981.0	4,981.0	54.0	92.0
68	4,219.1	4,219.1	52.7	80.0	156	4,514.9	4,223.8	46.7	96.8	244	4,712.7	4,712.7	49.0	95.9
69	4,275.4	4,275.4	53.4	80.0	157	4,392.7	4,353.3	46.4	95.4	245	5,722.8	4,897.6	60.4	97.8
70	4,000.0	4,000.0	50.0	80.0	158	5,396.0	4,974.0	58.7	94.5	246	7,204.0	5,905.8	67.2	120.3
71	4,000.0	4,000.0	50.0	80.0	159	4,865.4	4,865.4	53.5	91.0	247	7,404.7	6,242.9	57.9	121.5
72	4,000.0	4,000.0	50.0	80.0	160	5,211.2	5,084.5	58.2	90.6	248	6,096.7	5,416.3	42.0	131.8
73	4,631.5	4,631.5	55.5	83.8	161	5,526.7	5,051.1	56.3	101.3	249	8,950.7	6,801.3	69.6	124.1
74	4,934.2	4,934.2	59.0	84.2	162	4,377.4	3,853.3	42.0	104.6	250	8,456.6	5,194.6	60.4	136.9
75	4,799.9	4,799.9	59.3	81.5	163	4,306.6	3,816.1	42.0	102.6	251	5,771.5	5,771.5	44.0	149.1
76	5,576.7	4,987.6	58.1	86.1	164	4,215.9	3,819.2	42.4	99.5	252	5,015.1	5,015.1	44.0	15.4
77	7,403.9	5,352.3	66.3	83.2	165	4,043.9	3,785.6	42.0	96.4	253	4,750.1	4,750.1	44.0	107.9
78	6,178.9	4,554.3	57.1	80.1	166	4,162.6	3,972.7	44.4	93.4	254	4,855.2	4,855.2	44.0	108.1
79	4,990.5	4,000.0	50.0	80.0	167	4,253.7	3,998.0	44.7	94.6	255	4,948.5	4,948.5	47.1	105.1
80	4,990.5	4,000.0	50.0	80.0	168	4,347.1	3,968.7	43.9	99.2	256	4,610.6	4,610.6	46.6	99.1
81	4,990.5	4,000.0	50.0	80.0	169	4,829.4	4,344.2	47.4	101.9	257	4,306.2	4,306.2	45.8	94.2
82	4,990.5	4,000.0	50.0	80.0	170	4,304.6	3,780.0	42.0	102.4	258	4,266.9	4,266.9	46.6	91.3
83	5,025.0	4,027.2	50.3	80.0	171	4,371.5	3,780.0	42.0	103.9	259	4,623.4	4,613.5	50.4	91.6
84	5,237.8	4,169.8	52.1	80.0	172	4,481.2	3,833.2	42.0	106.7					
85	5,124.3	4,000.0	50.0	80.0	173	4,393.8	3,841.1	42.0	104.6					
86	5,149.5	4,000.0	50.0	80.0	174	4,313.8	3,774.5	42.0	103.2					
87	5,174.7	4,000.0	50.0	80.0	175	5,113.4	4,448.7	42.0	119.5					
88	5,200.0	4,000.0	50.0	80.0	176	7,352.1	6,592.8	48.2	137.7					

	GROSS LOT SIZE	NET LOT SIZE
TOTAL	1,223,191.0 SF 28.09 AC	1,136,486.6 SF 26.10 AC
AVERAGE	4,722.7 SF	4,388.0 SF

OPEN SPACE

LOT NO.	GROSS SQ.FT
LOT A 'PARK'	128,341.9
LOT B 'REC AREA'	26,361.5
LOT C 'PARKING'	6,636.4
LOT D 'S.D. ACCESS'	1,600.0
LOT E 'OPEN SPACE'	1,779,838.0
LOT F 'OPEN SPACE'	16,145.0
LOT G 'OPEN SPACE'	4,664.0
LOT H 'BASIN'	52,744.6
LOT I 'PVT DWY'	5,181.5
LOT J 'BB STREET'	11,580.5
LOT K 'Z STREET'	172,082.9
LOT L 'DD STREET'	37,811.2
LOT M 'EE STREET'	18,017.0
LOT N 'FF STREET'	17,990.0
LOT O 'LL' STREET	26,272.6
LOT P 'MM STREET'	14,162.8
LOT Q 'CC STREET'	54,119.9
LOT R 'JJ STREET'	18,476.7
LOT S 'II STREET'	47922.6
LOT T 'KK STREET'	18732.77
LOT U 'HH STREET'	29362.5
LOT V 'LL STREET'	16468.6
LOT W 'GG STREET'	22386.3
GRAND TOTAL	2,526,899.3 S.F. 57.987 Acres

LEGEND

——	PROJECT BOUNDARY
—W—W—	PROPOSED WATER LINE
—S—S—	PROPOSED SEWER LINE
—SD—SD—	PROPOSED STORM DRAIN
——	PROPOSED RIGHT OF WAY
— —	PROPOSED CENTERLINE
—600—	PROPOSED CONTOUR LINE
— —Y— —	TOP OF SLOPE
— —Y— —	TOE OF SLOPE
— —╥— —	DAYLIGHT LINE
— — —	PROPOSED EASEMENT
━ ━ ━	RETAINING WALL
—580—	EXISTING CONTOUR
(1)	LOT NUMBER
P=XXX.X	PAD ELEVATION

STREET SECTIONS

UTILITIES

ELECTRIC — SOUTHERN CALIFORNIA EDISON
26100 MENIFEE ROAD
MENIFEE, CA 92585
(800) 655–4555

TELEPHONE — VERIZON COMMUNICATIONS
1796 NORTH ST.
SAN BERNARDINO, CA 92405
(800) 483–5000

GAS — SOUTHERN CALIFORNIA GAS COMPANY
3700 CENTRAL AVE.
RIVERSIDE, CA.
(951) 781–6051

WATER — EASTERN MUNICIPAL WATER DISTRICT
P.O. BOX 8300
PERRIS, CA 92572
(951) 928–3777

SEWER — EASTERN MUNICIPAL WATER DISTRICT
P.O. BOX 8300
PERRIS, CA 92572
(951) 928–3777

CABLE T.V. — TIME WARNER CABLE
25836 A STREET
MURRIETA, CA 92562
(877) 794–7360

SCHOOL DISTRICT — MENIFEE UNION SCHOOL DISTRICT
29775 HAUN ROAD
MENIFEE, CA 92586
(951) 672–1851

PERRIS UNION HIGH SCHOOL DISTRICT
155 EAST FOURTH STREET
PERRIS, CA 92586
(951) 943–6369

PLANNING APPLICATION NO. PLN21-0199

REVISION	
DATE	DESCRIPTION

HUNSAKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A–15
RIVERSIDE CA 92504 (951)352–7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

CITY OF MENIFEE
OCTOBER 1, 2008

MAJOR MODIFICATION FOR
GOLDEN MEADOWS
TRACT 31194-4

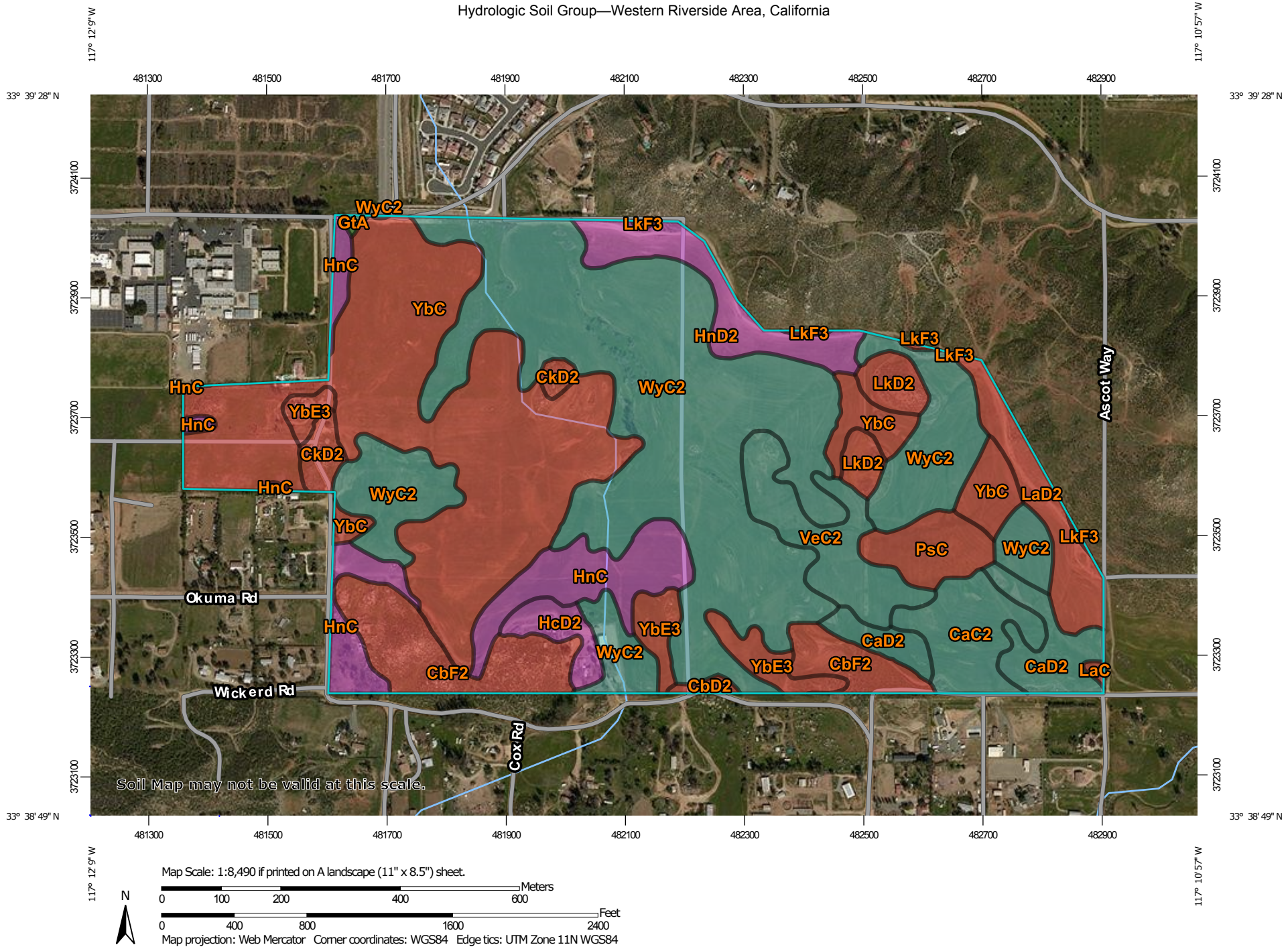
SHEET NO.
1
1 OF 1

PLOTTED BY: Danielle Fregoso DATE: Nov. 10, 2021 01:38:42 PM FILE: H:\00546\Planning\Maps\SITE PLAN 31194–01.dwg

Nov 10, 2021

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data



Map Scale: 1:8,490 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 11, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 24, 2015—Feb 26, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CaC2	Cajalco fine sandy loam, 2 to 8 percent slopes, eroded	C	7.5	3.3%
CaD2	Cajalco fine sandy loam, 8 to 15 percent slopes, eroded	C	7.3	3.3%
CbD2	Cajalco rocky fine sandy loam, 5 to 15 percent slopes, eroded	D	0.6	0.3%
CbF2	Cajalco rocky fine sandy loam, 15 to 50 percent slopes, eroded	D	13.6	6.1%
CkD2	Cieneba rocky sandy loam, 8 to 15 percent slopes, eroded	D	2.5	1.1%
GtA	Grangeville fine sandy loam, drained, 0 to 2 percent sl opes	A/D	0.2	0.1%
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	A	2.8	1.2%
HnC	Honcut sandy loam, 2 to 8 percent slopes	A	13.6	6.1%
HnD2	Honcut sandy loam, 8 to 15 percent slopes, eroded	A	7.6	3.4%
LaC	Las Posas loam, 2 to 8 percent slopes	D	0.2	0.1%
LaD2	Las Posas loam, 8 to 15 percent slopes, eroded	D	6.7	3.0%
LkD2	Las Posas rocky loam, 8 to 15 percent slopes, eroded	D	3.8	1.7%
LkF3	Las Posas rocky loam, 15 to 50 percent slopes, severely eroded	D	0.4	0.2%
PsC	Porterville clay, moderately deep, 2 to 8 percent slopes	D	4.8	2.2%
VeC2	Vallecitos loam, thick solum variant, 2 to 8 percent slopes, eroded	C	9.1	4.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
WyC2	Wyman loam, 2 to 8 percent slopes, eroded	C	79.8	35.7%
YbC	Yokohl loam, 2 to 8 percent slopes	D	57.0	25.5%
YbE3	Yokohl loam, 8 to 25 percent slopes, severely eroded	D	5.9	2.6%
Totals for Area of Interest			**223.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

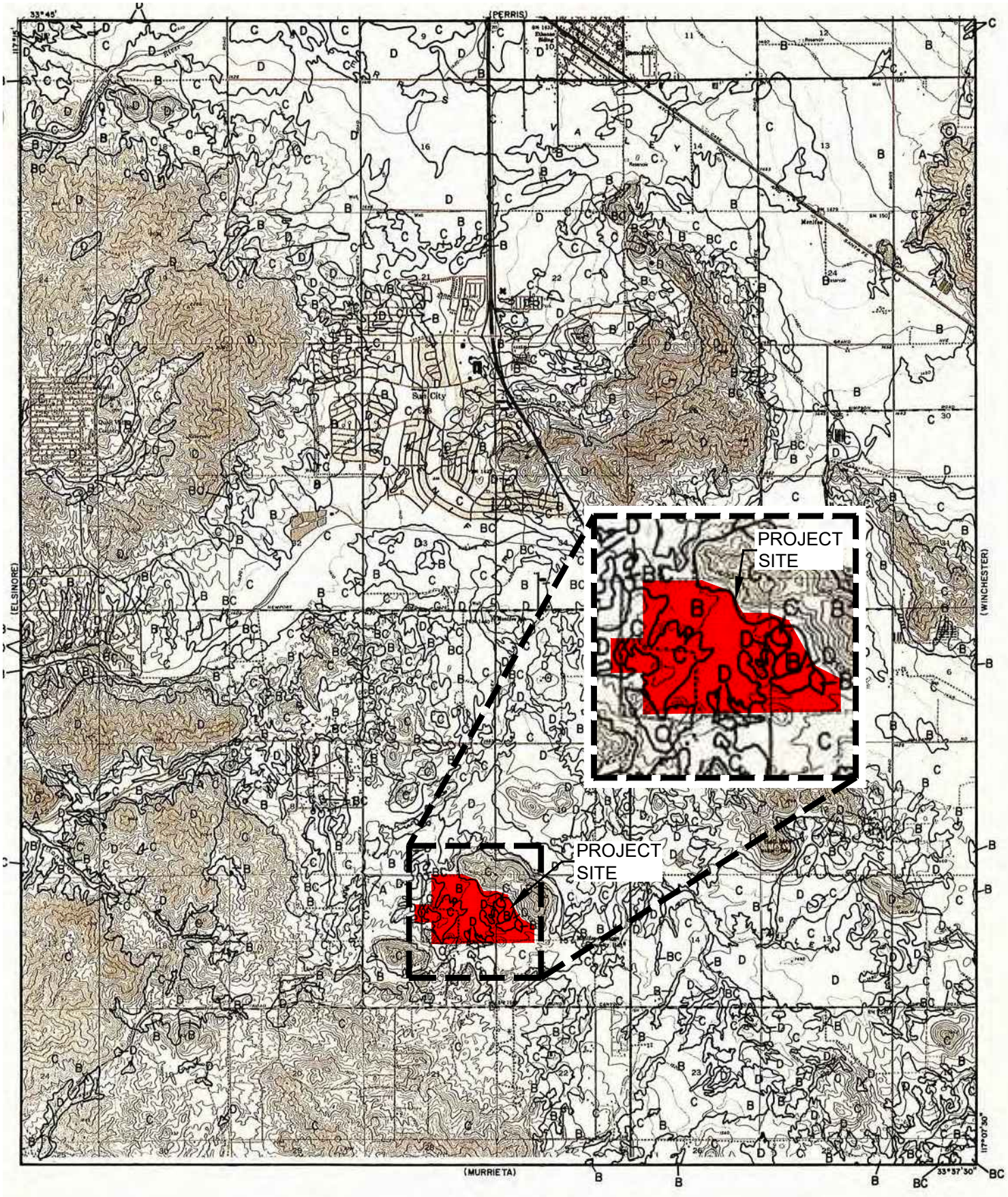
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR ROMOLAND

PLATE C-I.42

GEOTECHNICAL EXPLORATION
PROPOSED WATER TANK, GOLDEN MEADOWS – TRACT 31194, MENIFEE AREA, RIVERSIDE COUNTY, CALIFORNIA

DRAFT

Prepared for

RICHLAND COMMUNITIES, INC.

4100 Newport Place Drive
Newport Beach, California 92672

Project No. 11813.002

April 2, 2021

April 2, 2021

Project No. 11813.002

Richland Communities, Inc.
4100 Newport Place Drive
Newport Beach, California 92672

Attention: Mr. Brian Hardy, Vice President – Land Entitlement

Subject: Geotechnical Exploration
Proposed Water Tank, Golden Meadows – Tract 31194
Menifee Area, Riverside County, California

In accordance with our February 11, 2021, Leighton and Associates, Inc. (Leighton) is pleased to present this geotechnical exploration report for the proposed welded steel water tank to be constructed on the north side of the proposed Golden Meadows residential development, Tract 31194, located in the Menifee Area of Riverside County, California. This report presents our findings and conclusions, and geotechnical recommendations for design and construction of this proposed water tank.

Based on the results of this geotechnical exploration, the site of the proposed tank is generally a ridge top with moderate to steep surrounding slopes underlain by Cretaceous-Aged granitic rock (Gabbro). The site is not located within a currently designated Alquist-Priolo Special Studies Zone or a Riverside County fault zone.

We appreciate the opportunity to be of additional service. If you have any questions or if we can be of further assistance, please contact us at your convenience.

Respectfully Submitted,
LEIGHTON AND ASSOCIATES, INC.

Simon I. Saiid, GE 2641
Principal Engineer

Robert F. Riha, CEG 1921
Senior Principal Geologist

Distribution: (1) addressee (PDF via email)

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Figure 2 – Regional Geology Map
Figure 3 – Geotechnical Map

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Appendix A – Laboratory Test Results
Appendix B – Results of Seismic Refraction Survey
Appendix C – Site-Specific Seismic Coefficients
Appendix D - General Earthwork Grading Guidelines
Appendix E – GBA - Important Information About This Geotechnical-Engineering Report

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1.0 INTRODUCTION

1.1 Site Location and Description

The proposed water tank is located on a ridge top along the northern portion of Tract 31194, east of the intersection of Garbani Road and Evans Road in the Menifee Area of Riverside County, California *(see Site Location Map, Figure 1)*. This site is currently a vacant/undeveloped hilltop/ridgeline that slopes moderately to steeply in southerly and westerly directions. Site access is by a steep dirt road located to the south side of the site.

1.2 Proposed Water Tank

We understand that an approximately 103-foot diameter by 40-foot high welded steel water tank is proposed to be constructed at the Site as depicted on the provided conceptual grading plan (see Figure 3) with expansion pad for a potential future tank. Based on this plan, a desired pad elevation of 1,660 feet and cut slopes of up to approximately 60 feet in height may be constructed to create the required pad (future tank). Site access is expected to extend from an extension of Grabani Road and will also require cut slopes up to approximately 20 feet in height and fill slopes of up to approximately 40 feet in height. For the purpose of bearing capacity evaluation and slope stability analyses, a static pressure of 2,500 pound-per-square-foot (PSF) is assumed to be exerted by the proposed tank.

1.3 Purpose and Scope of Work

The purpose of our geotechnical study is to explore subsurface conditions at this proposed tank site and provide geotechnical recommendations for design and construction. In accordance with our proposal, the scope of this exploration has included the following tasks:

- **Desktop Review**: We reviewed relevant geotechnical literature, reports and aerial photographs for this tank site. These documents are referenced at the end of this report.
- **Geologic Mapping**: On February 17, 2021, we performed a site reconnaissance to observe site conditions and map any pertinent geologic features (i.e. bedding, joints, foliation, etc.) in existing/exposed cut slopes or

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natural bedrock exposures. We also collected surface samples for the purpose of laboratory testing and evaluation.

- **Geophysical Survey**: Four (4) seismic refraction lines were performed by our sub-consultant Atlas Technical Consultants, LLC. The purpose of this survey is to obtain readings/points for both vertical and lateral velocities so "tomography models" can be provided. Tomography is an enhanced seismic refraction method that allows changes in layer velocity to be revealed as gradients rather than discrete contacts. The seismic refraction survey report is presented in whole in Appendix B. The approximate locations of the survey transects are shown on Figure 3, Geotechnical Map. Three survey lines were conducted at the tank site and one survey line was conducted along the cut area for the planned access road.

- **Geotechnical Laboratory Testing**: Geotechnical laboratory tests were performed on surficial earth material collected during our site reconnaissance. Tests performed are included in Appendix A.

- **Geotechnical Analyses**: Data obtained from our background review, field exploration and geotechnical laboratory testing was evaluated to develop geotechnical conclusions and recommendations presented in this report.

- **Report Preparation**: Results of our geotechnical exploration have been summarized in this report to address geotechnical conditions encountered at the site, including our geotechnical findings, conclusions and recommendations for tank design and construction.

Important information about limitations of geotechnical reports is presented in Appendix E, *GBA Important Information About This Geotechnical Engineering Report*.

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2.0 FINDINGS

2.1 Regional Geology/Settings

The subject property is located within a prominent natural geomorphic province in southwestern California known as the Peninsular Ranges. This province is characterized by steep, elongated ranges and valleys that generally trend northwestward. Tectonic activity along the numerous faults in the region has created the geomorphology present today. Specifically, the property is situated in the southern portion of the Perris Block, a stable, eroded mass of Cretaceous and older crystalline and metamorphic rock. Thin sedimentary, metamorphic and volcanic units locally mantle the bedrock with alluvial deposits filling in the lower valley and drainage areas. The Perris Block is bounded by the San Jacinto Fault Zone to the northeast, the Elsinore Fault Zone to the southwest, the Cucamonga Fault Zone to the northwest and the poorly-defined northern boundary of the Temecula Basin to the southeast. The Temecula segment of the active Lake Elsinore Fault Zone is located approximately 6.4 miles to the southwest.

2.2 Site Geology

As regionally mapped on Figure 2, the site is underlain by gabbroic bedrock. Our field exploration indicates that this bedrock is generally covered with a relatively thin layer of surficial soils as further described below.

2.2.1 Surficial Soils: Surficial soils including topsoil and localized artificial fill should be expected within the site. These soils are expected to be relatively shallow (<3 feet), but they may be deeper in localized areas such as current access road. Expansion Index (EI) testing was performed on a representative soil sample indicate that these materials (silty sand) possess a very low expansion potential (EI=0). Test results are included in Appendix A.

2.2.2 Cretaceous-Aged Gabbroic Bedrock: Bedrock is exposed on outcrops and on steeper hillsides throughout the site. This granular granitic-type bedrock is generally dark gray in color, massive and jointed. Where exposed on the surface, the bedrock is moderately weathered and creates boulders along the hillsides up to 10 feet in diameter. The elevated portion of the site (north of future tank) has been cut into a relatively flat pad with bedrock exposed at the surface. The bedrock breaks down into granular silty to well-graded sand with gravel.

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Jointing is common within this bedrock unit, limited exposures of undisturbed in-place bedrock were encountered throughout the site. Jointing typically dips to the south or southwest. Bedrock cut slopes will need to be geologically mapped as they are excavated to confirm the anticipated structural pattern and long-term stability.

2.3 Rippability and Excavation Characteristics

Review of provided conceptual site design indicates cuts (excavation below existing ground surface) up to 60 feet may be required to create the proposed pad for future tank and up to 20 feet for the proposed access road.

Based on our seismic refraction survey data performed by Atlas Technical Consultants, LLC. (Appendix B), rippable bedrock using Caterpillar D-9 dozer with a single shank should be anticipated to a depth of 10 to 20 feet BGS or may vary depending on location. However, very difficult ripping or blasting (or other rock reducing techniques) should be anticipated for deeper excavations or where measured shear wave velocities exceed 4,000 foot-per-second (fps) as shown on the “Tomograpgy Models” included in Appendix B. The relatively shallow and hard rock zones (green to red color) are likely due to buried corestones/remnant boulders, dikes, and/or less weathered rock.

A summary of the seismic refraction survey including rippability criteria based a Caterpillar D-9 dozer with a single shank is further provided in Appendix B. Trench excavation characteristics using conventional excavators may vary based on the specific equipment used. It is important that a contractor with excavation experience in similar conditions be consulted for the proper excavation methodology, equipment, and production rate based on the findings of this report.

2.4 Surface and Groundwater

Surface water was not encountered on this site during our field exploration. Groundwater is not expected to be encountered within the depth of excavation. However, localized seeps may occur at Formation contacts or in fractured zones immediately after rain events.

2.5 Faulting and Seismicity

Seismic hazards in Southern California could include strong ground shaking and fault rupture. No currently-known active surface faults cross or trend towards this

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project site. The subject site is not included within an Earthquake Fault Zone as created by the Alquist-Priolo Earthquake Fault Zoning Act (Bryant and Hart, 2007). The nearest zoned active faults are the Temecula Segment of the Elsinore Fault Zone, approximately 6.4 miles southwest of the site and the Glen Ivy Segment of the Elsinore Fault Zone is located approximately 15.6 miles northwest of the site

A detailed review of vertical, sequential, stereo aerial photograph pairs was conducted to identify possible geomorphic evidence of faulting and landsliding. Various photos taken between 1949 and 1999 were reviewed (see references). Our review of aerial photographs and subsequent field observations do not provide geomorphic evidence supporting the existence of faulting or reveal any photo-lineaments that are typically associated with faulting in this region. The recent (<11,000 years) geologic history of this area reflects that this site is undergoing a regressive, erosional sequence. As observed in the aerial photographs, there are several deeply cut active, drainage channels that do not show any horizontal displacement that may be associated with active faulting.

2.6 Secondary Seismic Hazards

In general, secondary seismic hazards for sites in the region could include soil liquefaction, earthquake-induced settlement, lateral displacement and landsliding. The potential for secondary seismic hazards at the site is discussed below.

2.6.1 Seismically Induced Settlement: Seismically induced settlement consists of dry dynamic settlement (above groundwater) and liquefaction-induced settlement (below groundwater). During a strong seismic event, seismically induced settlement can occur within loose to moderately dense sandy soil due to reduction in volume during and shortly after a large, long-duration local earthquake. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. Based on the results of our exploration, seismic settlement is not considered a geotechnical constraint for this tank.

2.6.2 Seismically Induced Landslides: Based on the underlying bedrock formation and our review of aerial photographs and field observations, the site is not susceptible to seismically induced landslides.

2.7 Slope Stability

Proposed cut slopes up to 60 feet in height at 2:1 (horizontal:vertical) gradients are considered grossly stable for static and pseudo-static conditions. Compacted fill

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slopes up to 20 feet in height at 2:1 gradients are also considered grossly stable for static and pseudo-static conditions. Cut slopes, should be observed by an engineering geologist during grading to verify jointing or fracture patterns and recommend remedial measures, if needed.

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3.0 CONCLUSIONS AND RECOMMENDATIONS

Based on results of this geotechnical exploration, the proposed tank site pad is underlain by granitic rock/Gabbro. The site is not located within a currently designated Alquist-Priolo Special Studies Zone or a Riverside County fault zone. However, as is the case for most of Southern California, strong ground shaking has and will occur at this site. Our geotechnical recommendations for design and construction of this proposed water tank are presented in the following sections.

3.1 Tank Foundation Location

Based on proposed pad elevations, the tank pad will be entirely cut into the granitic rock. Due to potentially weathered bedrock material along the shallow cut (daylight) areas we recommend a setback of 15 feet horizontally from daylight to ring foundation.

3.2 Earthwork

Earthwork is expected to generally consist of cut pad and access road excavation, pad surface preparation, and footing and pipeline construction. In addition, minor filling (~15 feet) may be required on the downhill side for access road. Specific earthwork recommendations are provided in the following subsections:

3.2.1 Site Preparation: Based on proposed grading concept, the tank pad is expected to expose dense gabbroic rock. If highly weathered bedrock/loose rocks or any undesirable geologic features are exposed within portions of the tank pad and/or subgrade for the access road, then such conditions should be addressed by the project geotechnical engineer or geologist prior to foundation construction.

3.2.2 Fill Placement and Compaction: Onsite very low expansive (EI<21) soils free of organics, debris, and oversized material less than (≤) 3-inches in largest dimension are suitable for use as structural fill on this site. Soils to be placed as fill, whether onsite or import material, should be reviewed by Leighton and tested if and as necessary.

To provide uniform subgrade and fill any potential voids created from removal of loose rock/materials, we recommend that a minimum of 6-inch layer consisting of granular base (Caltrans Class 2 or equivalent) be placed prior to construction of concrete floor slab. However, if removal of rock or loose material creates voids larger than 2 feet in depth, such areas should be subject to further evaluation as potentially needing additional filling procedures.

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Where fill is being placed at slopes steeper-than (>) 5:1 (horizontal:vertical), proper surface preparations and benching should be implemented in accordance with latest edition of the "Greenbook", and approved by Leighton during construction. A 15-foot wide minimum fill slope keyway should be prepared to support the tank pad slope and access road fill slope (see Figure 5). As such, all areas to receive fill, including processed areas, fill slope, and benches, should be observed, mapped, and approved or tested by Leighton prior to proceeding with placement of fill.

3.2.3 Utility Trench Backfill: Utility trenches should be backfilled with compacted fill in accordance with Sections 306-1.2 and 306-1.3 of the "Greenbook". Utility trenches can be backfilled with on-site soils free of debris, organic and oversized material up to (≤) 3-inches in largest dimension. Prior to backfilling trenches, pipes should be bedded in and covered with either:

- **Sand**: A uniform, granular material that has a Sand Equivalent (SE) of (≥) 30 or greater and a maximum particle size of ¾-inches (or as specified by the pipe manufacturer), water densified in place, or
- **CLSM**: One sack cement slurry/Controlled Low Strength Material (CLSM) conforming to Section 201-6 of the "Greenbook".

Pipe bedding should extend at least 4-inches below any pipeline invert and at least 12 inches over the top of the pipeline. Native soils can be used as backfill over the pipe bedding zone, and should be placed in thin lifts, moisture conditioned above optimum, and mechanically compacted to at least 90 percent relative compaction, relative to the ASTM D 1557 laboratory maximum density.

3.3 Seismic Design Parameters

It is our understanding that the proposed water tank will be constructed of steel and the structural design of the tank will follow ANSI/AWWA D100-11. Therefore, the purpose of the seismic hazard evaluation is to identify and assess potential seismic hazards at the site in general accordance with the requirements of ANSI/AWWA D100, which generally follows the requirements of ASCE 7-16. Our seismic hazard evaluation includes development of peak ground acceleration (PGA) and design response spectra by using a seismic source model based on proximity of the site to active faults, major historical earthquakes, regional seismicity, and subsurface soil conditions at the site. Specifically, our scope includes estimation of peak horizontal ground acceleration and the response spectra at the site for the Maximum Considered Earthquake (MCE) and the Design

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Earthquake (DE) Site-specific ground motion parameters derived based on the requirements of ASCE 7-16, Chapters 11 and 21. These seismic coefficients were calculated utilizing an interactive program on current United States Geological Survey (USGS) website (referred to as USGS General Procedure). Based on our site-specific seismic refraction survey, this site is classified as a Class **B** site:

Table 1. 2019 CBC Site-Specific Seismic Parameters

2013 CBC Site-Specific Seismic Design Parameters	Value
Site Longitude (decimal degrees)	-117.18905
Site Latitude (decimal degrees)	33.6555
Site Class Definition	**B**
Mapped Spectral Response Acceleration at 0.2s Period, S_S	1.41
Mapped Spectral Response Acceleration at 1s Period, S_1	0.52
Short Period Site Coefficient at 0.2s Period, F_a	*0.9*
Long Period Site Coefficient at 1s Period, F_v	*0.8*
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	1.26
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	0.42
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	**0.84**
Design Spectral Response Acceleration at 1s Period, S_{D1}	**0.28**
Long-Period Transitions, T_L	**8 sec**

The results of this analysis also indicate that the adjusted Peak Ground Acceleration (PGA_m) for the MCE_G is 0.54g.

3.4 Tank Spread/Ring Footing Foundations

The proposed foundations and slabs should be designed in accordance with the structural consultants' design, the minimum geotechnical recommendations presented herein, and applicable ANSI/AWWA D100-11 requirements.

3.4.1 Minimum Embedment and Width: Conventional shallow spread/ring footings may be used to support the proposed tank, bearing solely on an undisturbed granitic rock approved by the geotechnical consultant. Tank footings should be embedded at least 12-inch below lowest adjacent grade, with a minimum width of 12-inch. These footings should have a minimum of 15 feet setback from adjacent descending slope/daylight.

3.4.2 Allowable Bearing Pressure: An allowable bearing pressure of 5,000 pounds-per-square-foot (psf) may be used for static and sustained live loads, based on minimum embedment depth and widths recommended above. The bearing pressure value may be increased by 250 psf for each additional foot of

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embedment or each additional foot of width to a maximum vertical bearing value of 6,000 psf. These allowable bearing pressures are for total dead loads and frequently applied live loads, and can be increased by one-third for short duration wind and seismic loads. Where applicable, a modulus of subgrade reaction of 450 pci may be used for design of footings/pads or any structures founded on this Formation.

All continuous footings should be reinforced with top and bottom reinforcing steel to provide structural continuity and to permit spanning of local irregularities. It is essential that we observe tank pad and footing excavations before reinforcing steel is placed.

3.4.3 Lateral Load Resistance: Lateral (horizontal) loads on foundations may be resisted by both frictional resistance along the base of the footing and passive resistance in properly compacted fill adjacent to the sides of footings. Frictional resistance between the base of footings poured (cast) directly on native rock or aggregate base may be computed using a coefficient of friction of 0.35, or 35-percent of sustained dead loads. Passive resistance may be computed using an equivalent fluid pressure of 300 pounds-per-cubic-foot (pcf) for undisturbed Pauba and/or new properly compacted fill. Passive pressure should not exceed 3,000 psf. These values may be increased by one-third when considering wind and seismic forces. Both friction and passive values have already been reduced by a factor-of-safety of 1.5, and can be used in combination.

3.4.4 Settlement Estimates: Based on the tank hydrostatic pressures presented in Section 1.2 (< 2,500 psf) and bearing on native rock, the settlement is expected to be less-than (<) ½-inch at the center of the tank and on the order of ¼-inch to negligible at the edge/perimeter.

3.5 Lateral Pressures for Retaining Structures

The lateral earth pressures below are provided for the design permanent retaining structures/walls. Earth pressures provided are ultimate values and a safety factor should be applied as appropriate.

Table 2. Static Lateral Earth Pressures

Conditions	Equivalent Fluid Weight (pcf)		
	Level Backfill[2]	2:1 Slope Backfill	1.5:1 Slope Backfill
Active (cantilever)	35	55	70
At-Rest (braced)	50	75	95
Passive[3]	250	-	-

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Notes:
(1) Assumes drained condition
(2) Assumes a level condition behind and in front of wall foundation of project.
(3) Maximum passive pressure = 3,500 psf, level conditions.

Determination of appropriate design conditions (active or at-rest) depends on wall flexibility. If a rotation of more than 0.001 radian (0.06 degrees) is allowed, active pressure conditions apply; otherwise, at-rest condition governs.

Surcharge due to above grade loads on the wall backfill, such as traffic, should be considered in design of retaining walls. Vertical surcharge loads behind the retaining wall on or in the backfill within a 1:1 (horizontal:vertical) plane projection up and out from the retaining wall toe, should be considered as lateral and vertical surcharge. Unrestrained (cantilever) retaining walls should be designed to resist one-third of these surcharge loads applied as a uniform horizontal pressure on the wall. Braced walls should also be designed to resist an additional uniform horizontal-pressure equivalent to one-half of uniform vertical surcharge-loads.

Additional lateral earth pressures due to seismic shaking should also be considered in the design. In accordance with current engineering practices and research, an increment of lateral earth pressure equal to $14H^2$ where H is the height of the wall, may be applied at a distance of 0.5H above the toe of the wall. If the wall is restrained, the above increment of lateral earth pressure should be doubled. Under the combined effects of static and earthquake loads on the wall, a factor of safety between 1.1 and 1.2 is acceptable when evaluating the stability (sliding, overturning) of the wall (NAVFAC DM 7.2).

Where applicable, a coefficient of friction of 0.35 may be considered between the concrete/shotcrete walls and the backfill surrounding the tank to estimate downward drag forces.

3.6 Asphalt Paving for Driveway / Access Road

Pavement construction associated with the proposed access road should conform to latest version of *Caltrans Standard Specifications* or the *Standard Specifications for Public Works Construction* (Greenbook), and applicable County Standards. Based on design procedures outlined in the current Caltrans *Highway Design Manual*, recommended flexible (asphalt) pavement section is tabulated below for an assumed Traffic Index (TI) of 4.0 and R-value of 40.

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Table 3. Preliminary Asphalt Pavement Section

Traffic Index	Thickness (inches)	
	Asphalt Concrete	Class 2 Aggregate Base
4.0	3.0	4.0

Representative samples of the actual subgrade materials for R-value testing, during subgrade preparation or prior to pavement construction, can be performed to refine this pavement design. An appropriate Traffic Index (TI) should be selected or verified by the project Civil Engineer prior to finalizing this pavement section design, based on anticipated truck traffic. This TI is based on only light auto and pickup-truck traffic.

Pavement subgrade soils should be prepared in accordance with Section 3.1 above. The Aggregate Base (AB) should be compacted to a minimum of 95 percent relative compaction (modified Proctor, ASTM D 1557). Aggregate base may be waived is asphalt concrete is placed directly on granitic rock.

3.7 Soil Corrosivity

3.7.1 Sulfate Attack: Sulfate ions in the soil can lower soil resistivity and can be highly aggressive to Portland cement concrete by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. Potentially high sulfate content could also cause corrosion of the reinforcing steel in concrete. The table below summarizes current standards for concrete exposed to sulfate-containing solutions:

Table 4. Sulfate Concentration and Sulfate Exposure

Sulfate In Water (parts-per-million)	Water-Soluble Sulfate (SO4) in soil (percentage by weight)	Sulfate Exposure
0-150	0.00 - 0.10	Negligible
150-1,500	0.10 - 0.20	Moderate (Seawater)
1,500-10,000	0.20 - 2.00	Severe
>10,000	Over 2.00	Very Severe

3.7.2 Ferrous Corrosivity: Many factors can affect corrosion potential of soil including soil moisture content, resistivity, permeability and pH, as well as chloride and sulfate concentration. In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor. Based on the findings of studies presented in ASTM STP 1013 titled “Effects of Soil

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Characteristics on Corrosion" (February, 1989), the relationship between soil resistivity and soil corrosiveness was developed as tabulated below:

Table 5. Relationship between Soil Resistivity and Soil Corrosivity

Soil Resistivity (ohm-cm)	Classification of Soil Corrosiveness
0 to 900	Very Severely Corrosive
900 to 2,300	Severely Corrosive
2,300 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
10,000 to >100,000	Very Mildly Corrosive

Acidity is an important factor of soil corrosivity. The lower the pH (the more acidic the environment), the higher the soil corrosivity will be with respect to buried metallic structures and utilities. As soil pH increases above 7 (the neutral value), the soil is increasingly more alkaline and less corrosive to buried steel structures, due to protective surface films, which form on steel in high pH environments. Chloride and sulfate ion concentrations, and pH appear to play secondary roles in affecting corrosion potential. High chloride levels tend to reduce soil resistivity and break down otherwise protective surface deposits, which can result in corrosion of buried steel or reinforced concrete structures.

3.7.3 Soil Corrosivity Test Results Summary: As a preliminary screening process for sulfates in soils, we have performed laboratory tests on a representative surface soil-sample. As summarized in Table 6 (below), our laboratory test results indicated negligible concentration of soluble sulfates. No special measures to mitigate sulfate exposure are recommended based on the test results. Import soils (if any) should also be tested for sulfate content.

Based on minimum-resistivity laboratory test results, the onsite soil is generally considered very mildly-corrosive to ferrous metals. Ferrous pipe can be protected by polyethylene bags, tape or coatings, di-electric fittings, concrete encasement or other means to separate the pipe from wet onsite clayey soils. Further testing of import and possibly site soil corrosivity could be performed and specific recommendations for corrosion protection may need to be provided by a qualified corrosion engineer.

Table 6. Soil Corrosivity Test Results Summary

Boring Number	Sample Depth (feet)	Sulfate Content (ppm)	Chloride Content (ppm)	pH	Resistivity (ohm-cm)
S-1	0 to 1	**111**	**20**	6.7	13,000

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4.0 CONSTRUCTION CONSIDERATIONS

4.1 Trench Excavations

Based on our field observations, caving of cohesionless and sandy soils will likely be encountered in unshored trench excavations. To protect workers entering excavations, excavations should be performed in accordance with OSHA and Cal-OSHA requirements, and the current edition of the California Construction Safety Orders, see:

http://www.dir.ca.gov/title8/sb4a6.html

Contractors should be advised that fill and cohesionless alluvial/colluvial soils should be considered Type C soils as defined in the California Construction Safety Orders. As such, excavations less-than (<) 20 feet deep within Type C soils should be sloped back no steeper than 1½:1 (horizontal:vertical), where workers are to enter the excavation. Weathered rock within upper 10 feet BGS may be classified as OSHA soil Type A. Therefore, unshored temporary cut slopes should be no steeper than ¾:1 (horizontal:vertical), for a height no-greater-than (≤) 10 feet. These recommended temporary cut slopes assume a level ground surface for a distance equal to one-and-a-half (x1.5) the depth of excavation. However, unshored excavations may be impractical near adjacent existing utilities and structures; so shoring may still be required depending on trench locations.

During construction, soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and Leighton. should be maintained to facilitate construction while providing safe excavations.

4.2 Temporary Trench Shoring

Typical cantilever shoring can be designed based on the active equivalent fluid pressure of 33 pounds-per-cubic-foot (pcf) where there is no adverse bedding. If excavations are braced at the top and at specific depth intervals, then braced earth pressure may be approximated by a uniform rectangular soil pressure distribution. This uniform pressure expressed in pounds-per-square-foot (psf), may be assumed to be 20 multiplied by H for design, where H is equal to the depth of the

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excavation being shored, in feet. These recommendations are valid only for trenches not exceeding 10-feet in depth at this site.

4.3 Geotechnical Services during Construction

Our geotechnical recommendations presented in this report are based on subsurface conditions as interpreted from limited subsurface explorations and limited geotechnical laboratory testing. Our geotechnical recommendations provided in this report are based on information available at the time the report was prepared and may change as plans are developed. Additional geotechnical exploration, testing and/or analysis may be required based on final plans. Leighton and Associates, Inc. should review site grading, foundation and shoring (if any) plans when available, to comment further on geotechnical aspects of this project and check to see general conformance of final project plans to recommendations presented in this report.

Leighton and Associates, Inc. should be retained to provide geotechnical observation and testing during excavation and all phases of earthwork. Our conclusions and recommendations should be reviewed and verified by us during construction and revised accordingly if geotechnical conditions encountered vary from our findings and interpretations. Geotechnical observation and testing should be provided:

- During all cut excavation,
- During compaction of all fill materials,
- After excavation of all footings and prior to placement of concrete,
- During utility trench backfilling and compaction,
- During pavement subgrade and base preparation (if any), and/or
- If and when any unusual geotechnical/geologic conditions are encountered.

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5.0 LIMITATIONS

This report was necessarily based in part upon data obtained from a limited number of observances, site visits, soil samples, tests, analyses, histories of occurrences, spaced subsurface explorations and limited information on historical events and observations. Such information is necessarily incomplete. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time. This exploration was performed with the understanding that this subject site is proposed for development as described in Section 1.2 of this report. Please refer to Appendix E, ASFE's *Important Information About Your Geotechnical Report*, prepared by the Associated Soil and Foundation Engineers (ASFE) presenting additional information and limitations regarding geotechnical engineering studies and reports.

This report was prepared for Richland Communities, Inc. based on their needs, directions and requirements at the time of our exploration. This report is not authorized for use by, and is not to be relied upon by any party except Richland Communities, Inc., and their successors and assigns, with whom Leighton has contracted for the work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton.

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Aerial Photos Reviewed:

3-12-99 C135 – 39 – 135-136

9-11-97 C116 – 39 – 46-47

10-4-95 CAP – 125-127

1-30-95 C104 – 39 – 10

2-2-93 C86 – 39 – 13

10-12-90 90205 – 125-126

7-30-86 86084

6-14-83 83045 – 101

12-14-79 79274 – 161A

5-15-67 2HH – 191-192

5-15-67 3HH – 20

5-23-49 9F – 124-125

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APPENDIX A

Current Study Laboratory Test Results

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TESTS for SULFATE CONTENT
CHLORIDE CONTENT and pH of SOILS

Project Name: Golden Meadows TR31194 Tank Geo Tested By : M. Vinet Date: 02/22/21

Project No. : 11813.002 Data Input By: M. Vinet Date: 02/23/21

Boring No.	S-1			
Sample No.	S-1			
Sample Depth (ft)	0 - 1.0			
Soil Identification:	Poorly Graded Sand with Silt (SP-SM)			
Wet Weight of Soil + Container (g)	100.00			
Dry Weight of Soil + Container (g)	100.00			
Weight of Container (g)	0.00			
Moisture Content (%)	0.00			
Weight of Soaked Soil (g)	100.00			

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	1			
Crucible No.	1			
Furnace Temperature (°C)	850			
Time In / Time Out	Timer			
Duration of Combustion (min)	45			
Wt. of Crucible + Residue (g)	25.1122			
Wt. of Crucible (g)	25.1095			
Wt. of Residue (g) (A)	0.0027			
PPM of Sulfate (A) x 41150	111.11			
PPM of Sulfate, Dry Weight Basis	**111**			

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30			
ml of AgNO3 Soln. Used in Titration (C)	0.4			
PPM of Chloride (C -0.2) * 100 * 30 / B	20			
PPM of Chloride, Dry Wt. Basis	**20**			

pH TEST, DOT California Test 643

pH Value	**6.70**			
Temperature °C	21.0			

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SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	Golden Meadows TR31194 Tank Geo		Tested By :	M. Vinet	Date: 02/22/21
Project No. :	11813.002		Data Input By:	M. Vinet	Date: 02/23/21
Boring No.:	S-1		Depth (ft.) :	0 - 1.0	
Sample No. :	S-1				

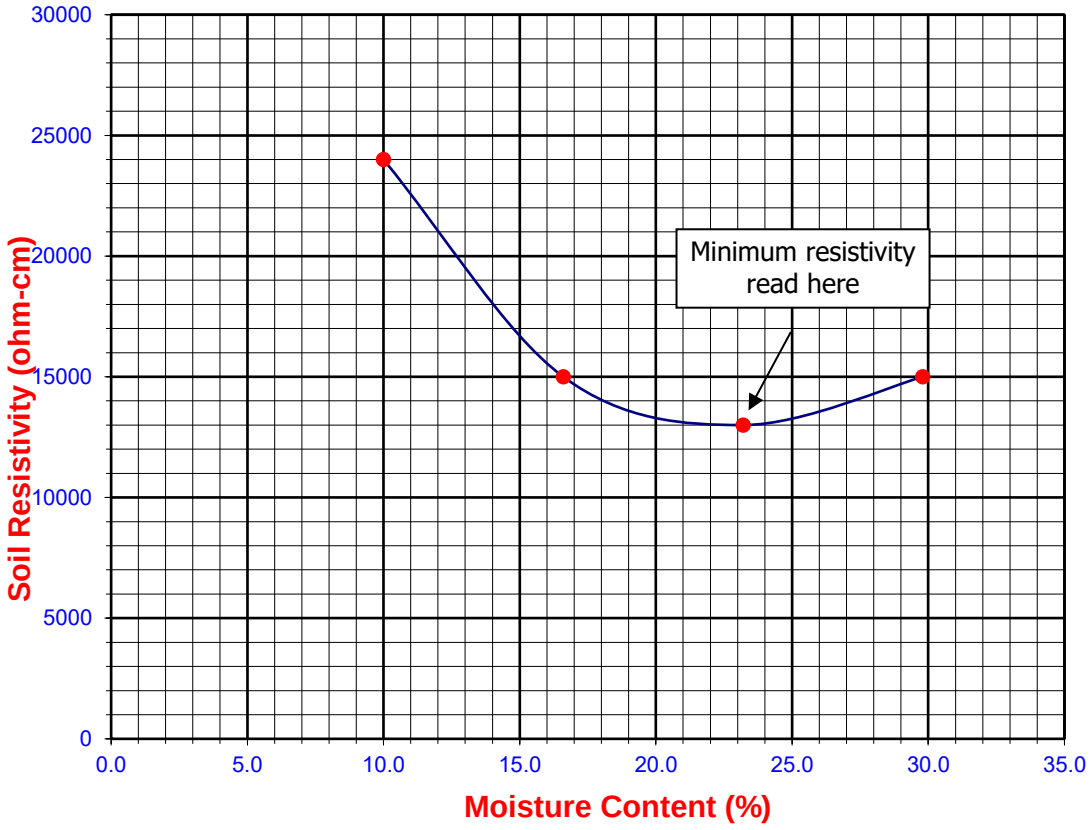
Soil Identification:* Poorly Graded Sand with Silt (SP-SM)

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	50	10.00	24000	24000
2	83	16.60	15000	15000
3	116	23.20	13000	13000
4	149	29.80	15000	15000
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	100.00
Dry Wt. of Soil + Cont. (g)	100.00
Wt. of Container (g)	0.00
Container No.	A
Initial Soil Wt. (g) (Wt)	500.00
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
13000	**23.2**	**111**	**20**	**6.70**	**21.0**



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EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	Golden Meadows TR31194 Tank Geo	Tested By:	M. Vinet	Date:	2/18/21
Project No. :	11813.002	Checked By:	M. Vinet	Date:	2/19/21
Boring No.:	S-1	Depth:	0 - 1.0		
Sample No. :	S-1	Location:	N/A		
Sample Description:	Poorly Graded Sand with Silt (SP-SM), Olive Brown.				

Dry Wt. of Soil + Cont. (gm.)	3350.7
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	3350.7
Weight Soil Retained on #4 Sieve	124.3
Percent Passing # 4	96.3

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	0.9935
Wt. Comp. Soil + Mold (gm.)	590.0	619.8
Wt. of Mold (gm.)	200.0	200.0
Specific Gravity (Assumed)	2.70	2.70
Container No.	11	11
Wet Wt. of Soil + Cont. (gm.)	627.8	619.8
Dry Wt. of Soil + Cont. (gm.)	599.3	352.9
Wt. of Container (gm.)	327.8	200.0
Moisture Content (%)	10.5	18.9
Wet Density (pcf)	117.6	127.5
Dry Density (pcf)	106.5	107.2
Void Ratio	0.584	0.573
Total Porosity	0.368	0.364
Pore Volume (cc)	76.3	74.9
Degree of Saturation (%) [S meas]	**48.6**	**89.2**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
2/18/21	11:30	1.0	0	0.5000
2/18/21	11:40	1.0	10	0.5000
	Add Distilled Water to the Specimen			
2/19/21	7:00	1.0	1160	0.4935
2/19/21	8:00	1.0	1220	0.4935

Expansion Index (EI meas) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	-6.5
Expansion Index (Report) = Nearest Whole Number or Zero (0) if Initial Height is > than Final Height	**0**

Rev. 03-08

APPENDIX B

Seismic Refraction Survey

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SEISMIC REFRACTION STUDY

GOLDEN MEADOWS TANK EXPLORATION

Menifee, California

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March 9, 2021

Atlas No. 121058SWG
Report No. 1

MR. JEFFERY DELAND
LEIGHTON & ASSOCIATES, INC.
17781 COWAN
IRVINE, CA 92614

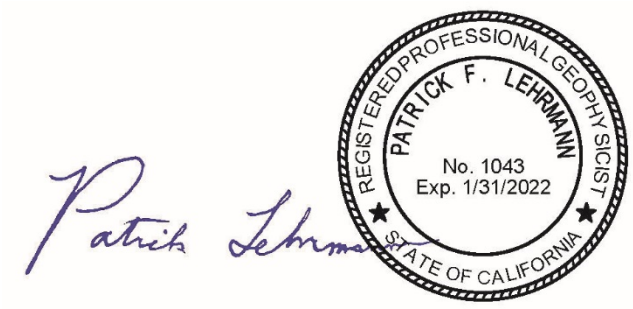
Subject: Seismic Refraction Study
Golden Meadows Tank Exploration
Menifee, California

Dear Mr. Deland:

In accordance with your authorization, Atlas Technical Consultants has performed a seismic refraction study pertaining to the Golden Meadows Tank Exploration project located in Menifee, California. Specifically, our evaluation consisted of performing four seismic P-wave refraction traverses at the project site. The purpose of our evaluation was to develop subsurface velocity profiles of the study areas in order to assess the depth to bedrock and apparent rippability of the subsurface materials. Our field services were conducted on February 17th, 2021. This data report presents our methodology, equipment used, analysis, and results.

If you have any questions, please call us at 619.280.4321.

Respectfully submitted,
Atlas Technical Consultants LLC



Evan C. Anderson
Senior Staff Geophysicist

Patrick F. Lehrmann, P.G., P.Gp.
Principal Geologist/Geophysicist

ECA:PFL:ds

Distribution: Mr. Jeffery DeLand at @leightongroup.com

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1. INTRODUCTION

In accordance with your authorization, Atlas Technical Consultants has performed an additional seismic refraction study pertaining to the Golden Meadows Tank Exploration project located in Menifee, California (Figure 1). Specifically, our evaluation consisted of performing four seismic P-wave refraction traverses at the project site. The purpose of our evaluation was to develop subsurface velocity profiles of the study areas in order to assess the depth to bedrock and apparent rippability of the subsurface materials. Our field services were conducted on February 17th, 2021. This data report presents our methodology, equipment used, analysis, and results.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of four seismic P-wave refraction traverses at the project site.
- Compilation and analysis of the data collected.
- Preparation of this data report presenting our results and conclusions.

3. SITE AND PROJECT DESCRIPTION

The project site is generally located west of State Route 215 and east of State Route 15 in Menifee, California (Figure 1). Specifically, the seismic traverses are located at the termination of Garbani Road along the southern slope of the adjacent hill. The seismic traverses were performed over slight to moderately steep terrain. Granite outcrops were present throughout the study areas. The study site was marked by dry, knee-high brush throughout. Figures 2 and 3 depict the general site conditions in the areas of the seismic traverses.

Based on our discussions with you, it is our understanding that new construction activities are proposed at the site and the results of our study may be used for the design and construction parameters pertaining to the project.

4. STUDY METHODOLOGY

A seismic P-wave (compression wave) refraction study was conducted at the project site to evaluate the rippability characteristics of the subsurface materials and to develop subsurface velocity profiles of the area studied. The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. Seismic P-waves generated at the surface, using a hammer and plate, are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface vertical component 14.5-Hz geophones and recorded with a 24-channel Geometrics Geode seismograph. The travel times of the seismic P-waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

Four seismic traverses (SL-1 and SL-4) were conducted in the study area. The general locations and lengths of the lines were determined by surface conditions, site access, and depth of investigation. Shot points (signal generation locations) were conducted along the lines at the ends, midpoint, and intermediate points between the ends and the midpoint.

The seismic refraction theory requires that subsurface velocities increase with depth. A layer having a velocity lower than that of the layer above will not generally be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity, such as those caused by core stones, intrusions, or boulders can also result in the misinterpretation of the subsurface conditions. In general, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth of the length of the spread.

In general, the seismic P-wave velocity of a material can be correlated to rippability (see Table 1 below), or to some degree "hardness." Table 1 is based on published information from the Caterpillar Performance Handbook (Caterpillar, 2018), as well as our experience with similar materials, and assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that rock characteristic, such as fracture spacing and orientation, play a significant role in determining rock quality or rippability. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

For trenching operations**,** the rippability values should be scaled downward. For example, velocities as low as 3,500 feet/second may indicate difficult ripping during trenching operations. In addition, the presence of boulders, which can be troublesome in narrow trenching operations, should be anticipated.

Table 1 – Rippability Classification

Seismic P-wave Velocity	Rippability
0 to 2,000 feet/second	Easy
2,000 to 4,000 feet/second	Moderate
4,000 to 5,500 feet/second	Difficult, Possible Blasting
5,500 to 7,000 feet/second	Very Difficult, Probable Blasting
Greater than 7,000 feet/second	Blasting Generally Required

It should be noted that the rippability cutoffs presented in Table 1 are slightly more conservative than those published in the Caterpillar Performance Handbook. Accordingly, the above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

5. DATA ANALYSIS

The collected data was processed using SIPwin (Rimrock Geophysics, 2003), a seismic interpretation program, and analyzed using SeisOpt Pro (Optim, 2008). SeisOpt Pro uses first arrival picks and elevation data to produce subsurface velocity models through a nonlinear optimization technique called adaptive simulated annealing. The resulting velocity model provides a tomography image of the estimated geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions.

6. RESULTS AND CONCLUSIONS

As previously indicated, four seismic traverses were conducted as part of our study. Figures 4a, 4b, 4c, and 4d present the velocity models generated from our analysis. Based on the results, it appears the project site is underlain by moderately low-velocity materials in the very near-surface and higher velocity materials in the shallow surface. Distinct vertical and lateral velocity variations are evident in the models. Moreover, the degree of weathering and the depth to possible bedrock varies across the study area.

Based on the refraction results, variability in the excavatability (including depth of rippability) of the subsurface materials should be expected across the project areas. In addition, oversized materials should be expected. A contractor with excavation experience in similarly difficult conditions should be consulted for expert advice on excavation methodology, equipment, and production rate.

7. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Atlas should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

8. SELECTED REFERENCES

Caterpillar, Inc., 2018, Caterpillar Performance Handbook, Edition 48, Caterpillar, Inc., Peoria, Illinois.

Mooney, H.M., 1976, Handbook of Engineering Geophysics, dated February.

Optim, Inc., 2008, SeisOpt Pro, V-5.0.

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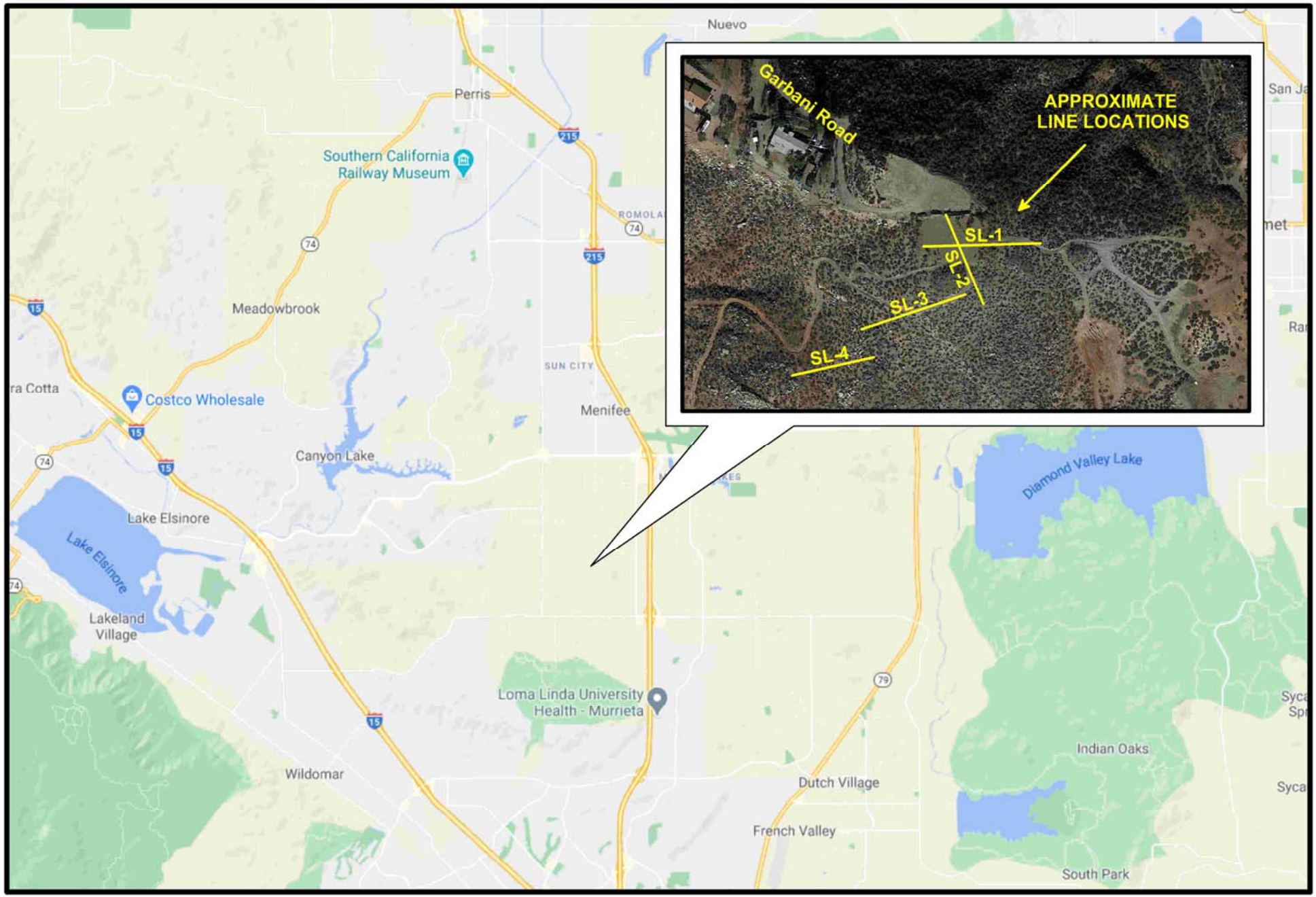
Telford, W.M., Geldart, L.P., Sheriff, R.E., and Keys, D.A., 1976, Applied Geophysics, Cambridge University Pres.



SITE LOCATION MAP

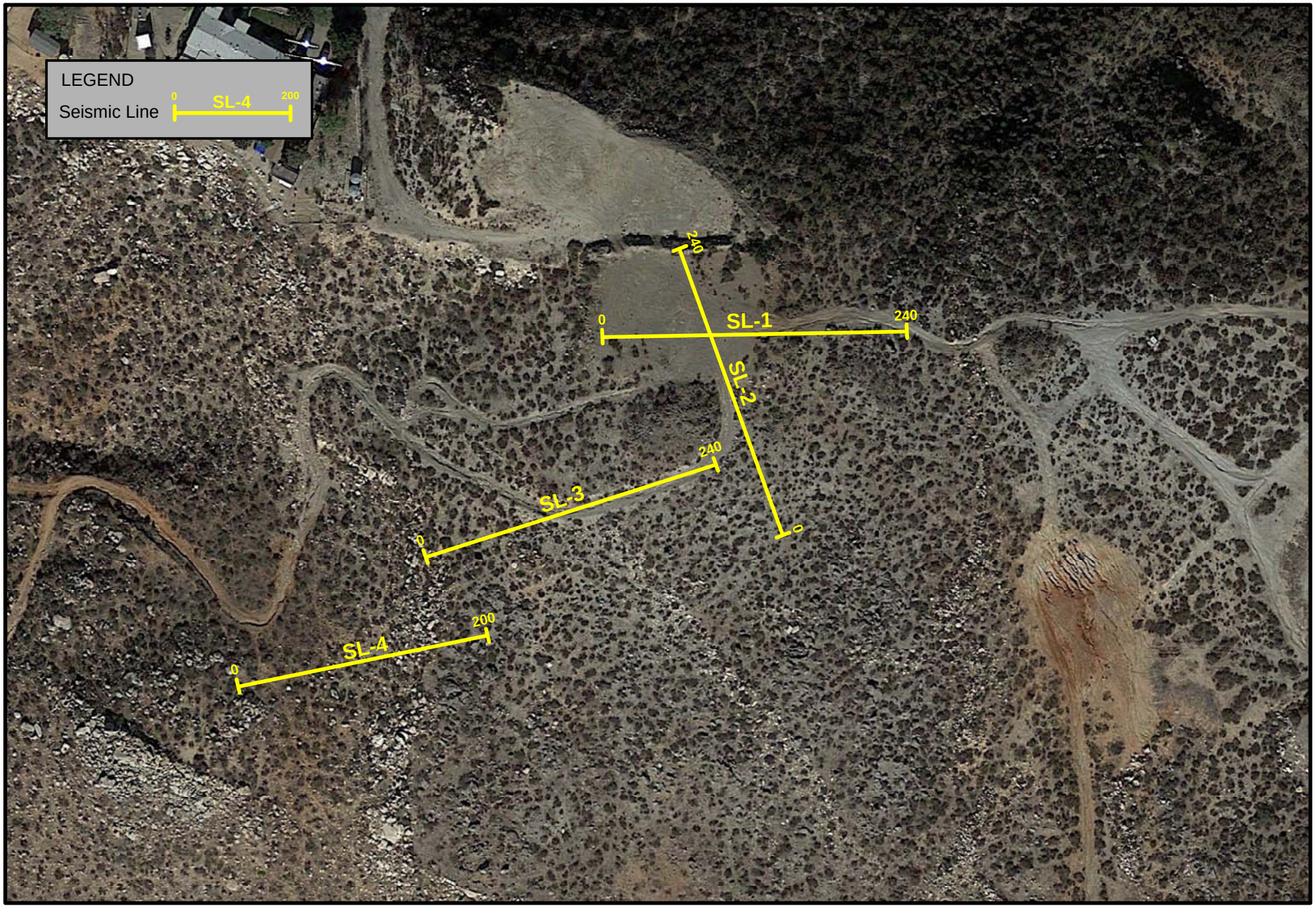
N

Golden Meadows Tank Exploration
Menifee, California

Project No.: 121058SWG | Date: 03/21

ATLAS

Figure 1



SEISMIC LINE LOCATION MAP

N

Golden Meadows Tank Exploration
Menifee, California

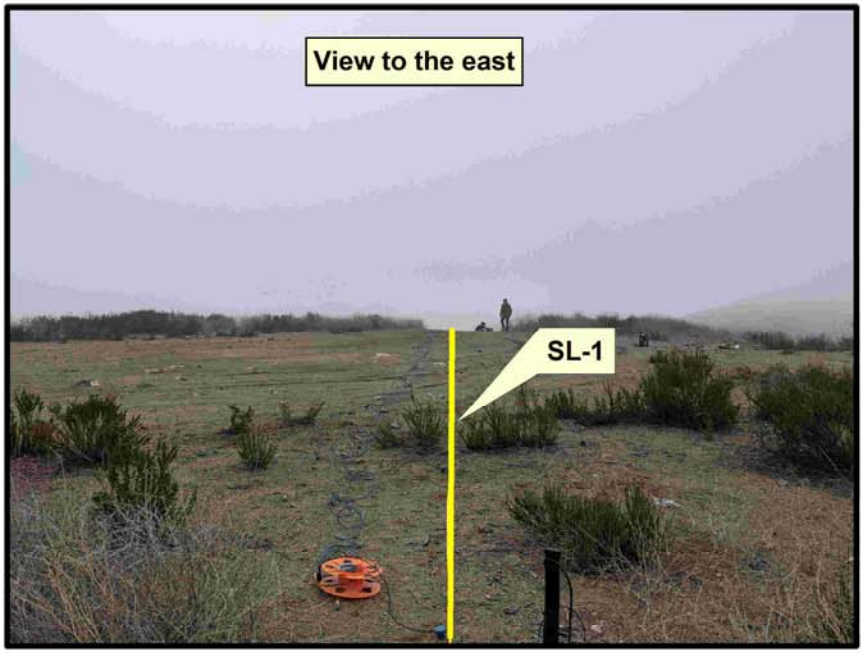
Project No.: 121058SWG | Date: 03/21

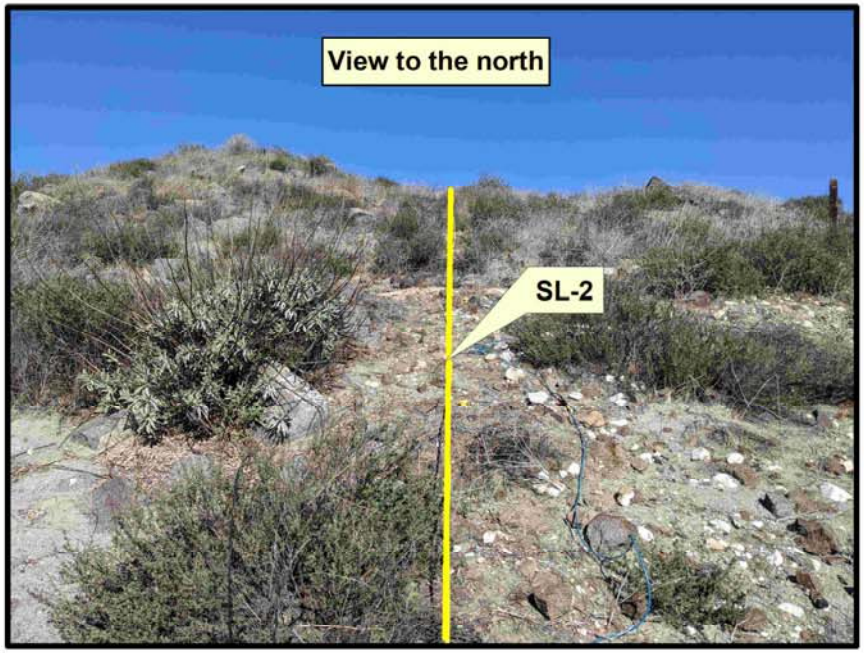
ATLAS

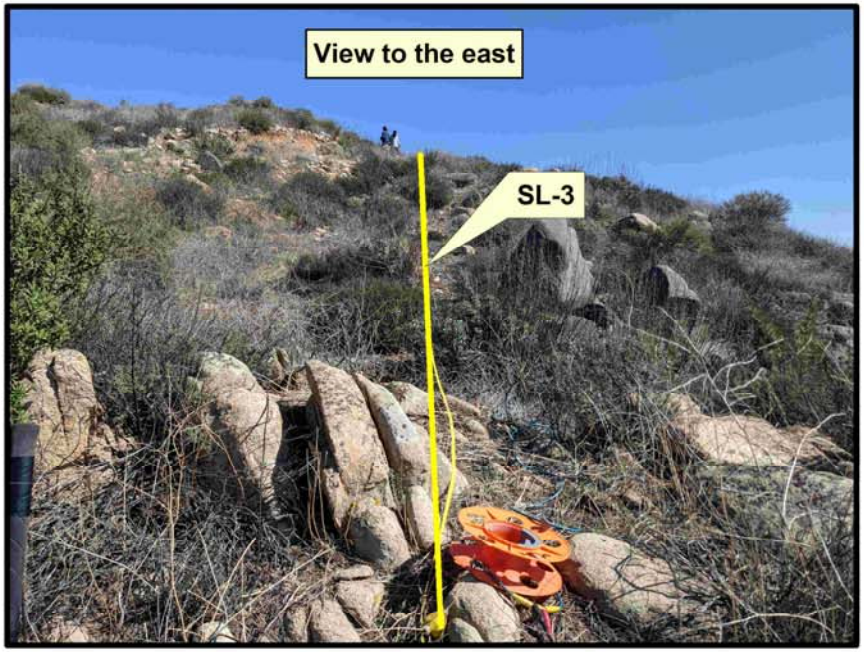
Figure 2

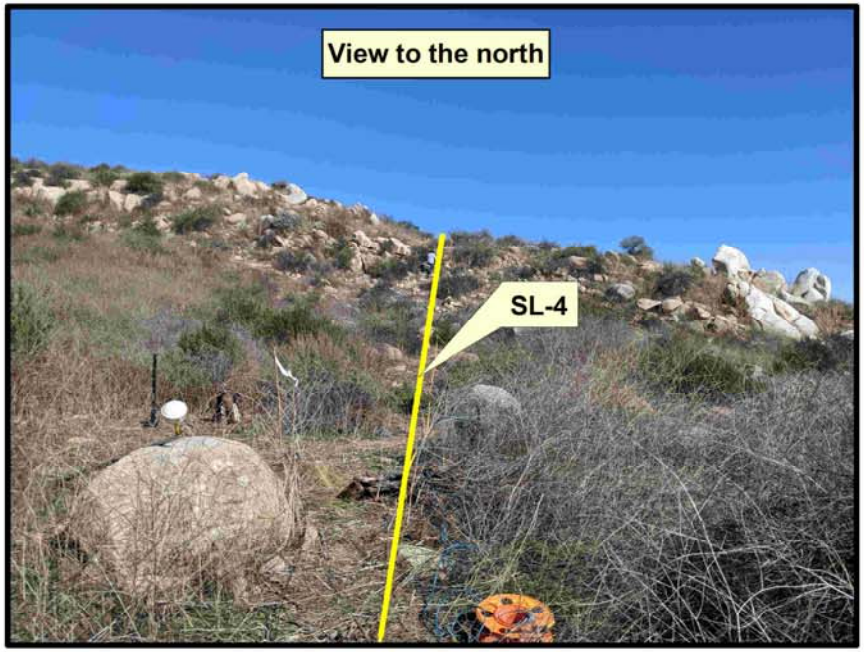
0 100 200

approximate scale in feet









SITE PHOTOGRAPHS

Golden Meadows Tank Exploration
Menifee, California

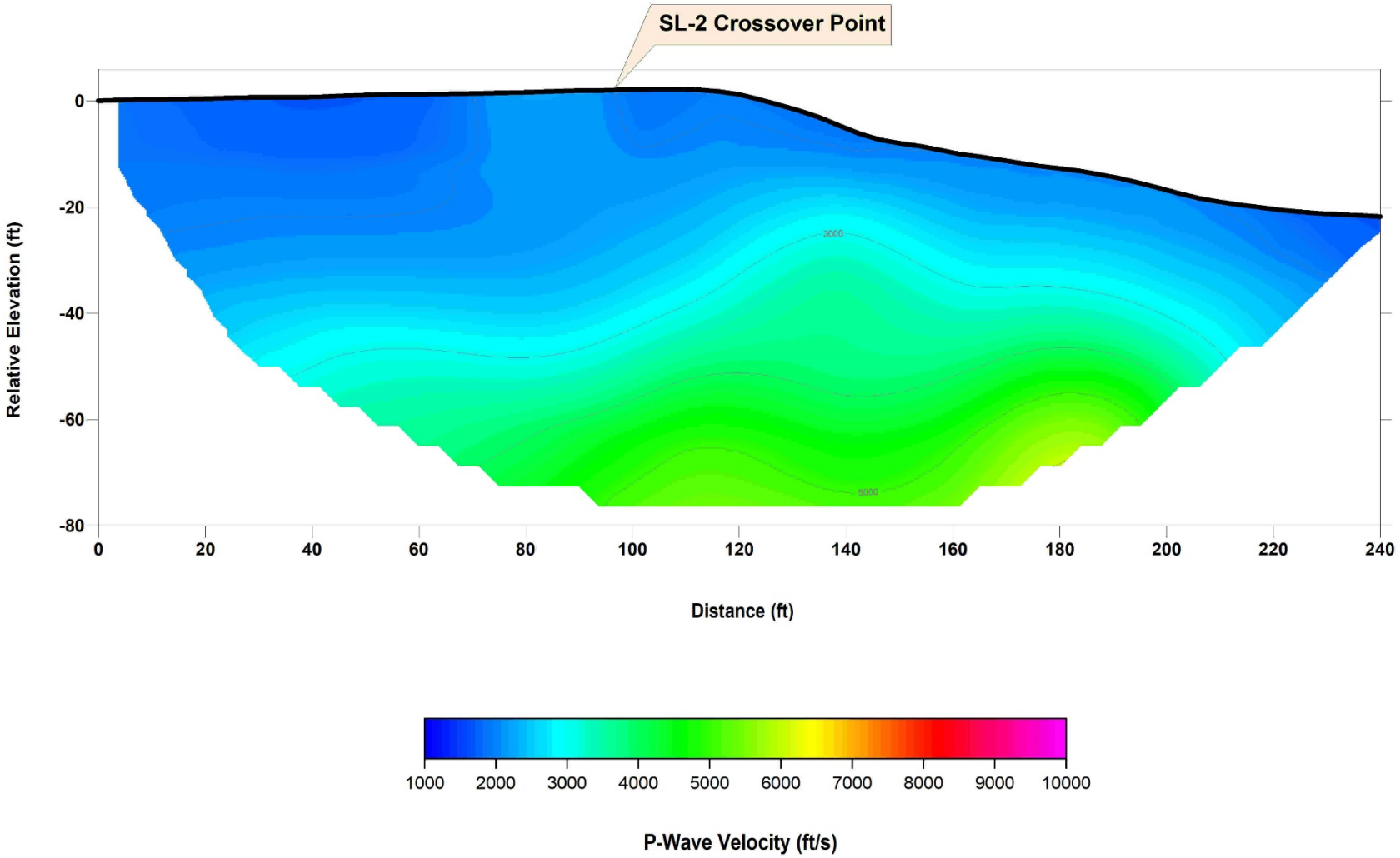
Project No.: 121058SWG | Date: 03/21

ATLAS

Figure 3

TOMOGRAPHY MODEL

SL-1

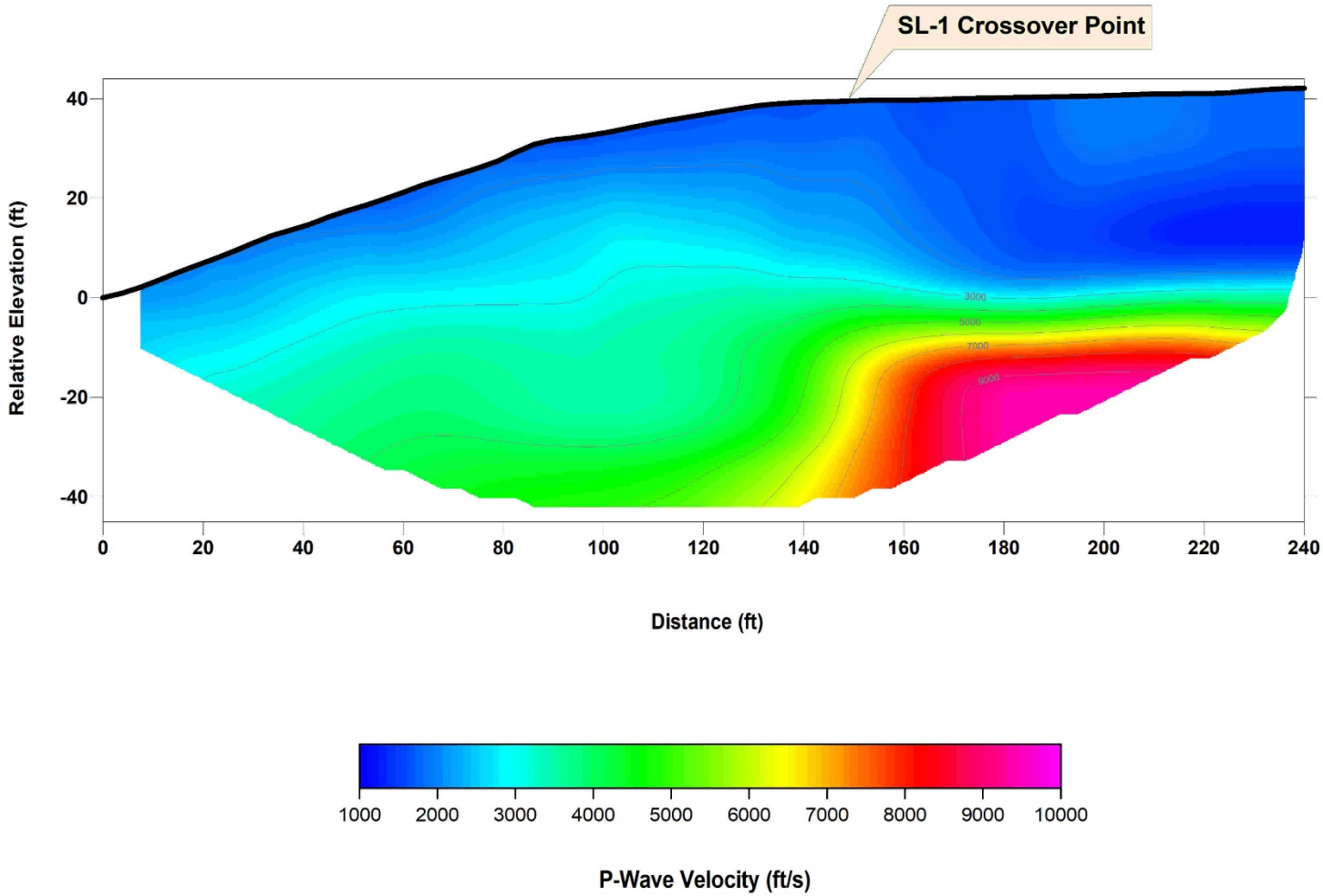


SEISMIC PROFILE SL-1	Golden Meadows Tank Exploration Menifee, California	ATLAS Figure 4a
	Project No.: 121058SWG | Date: 03/21	

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-2

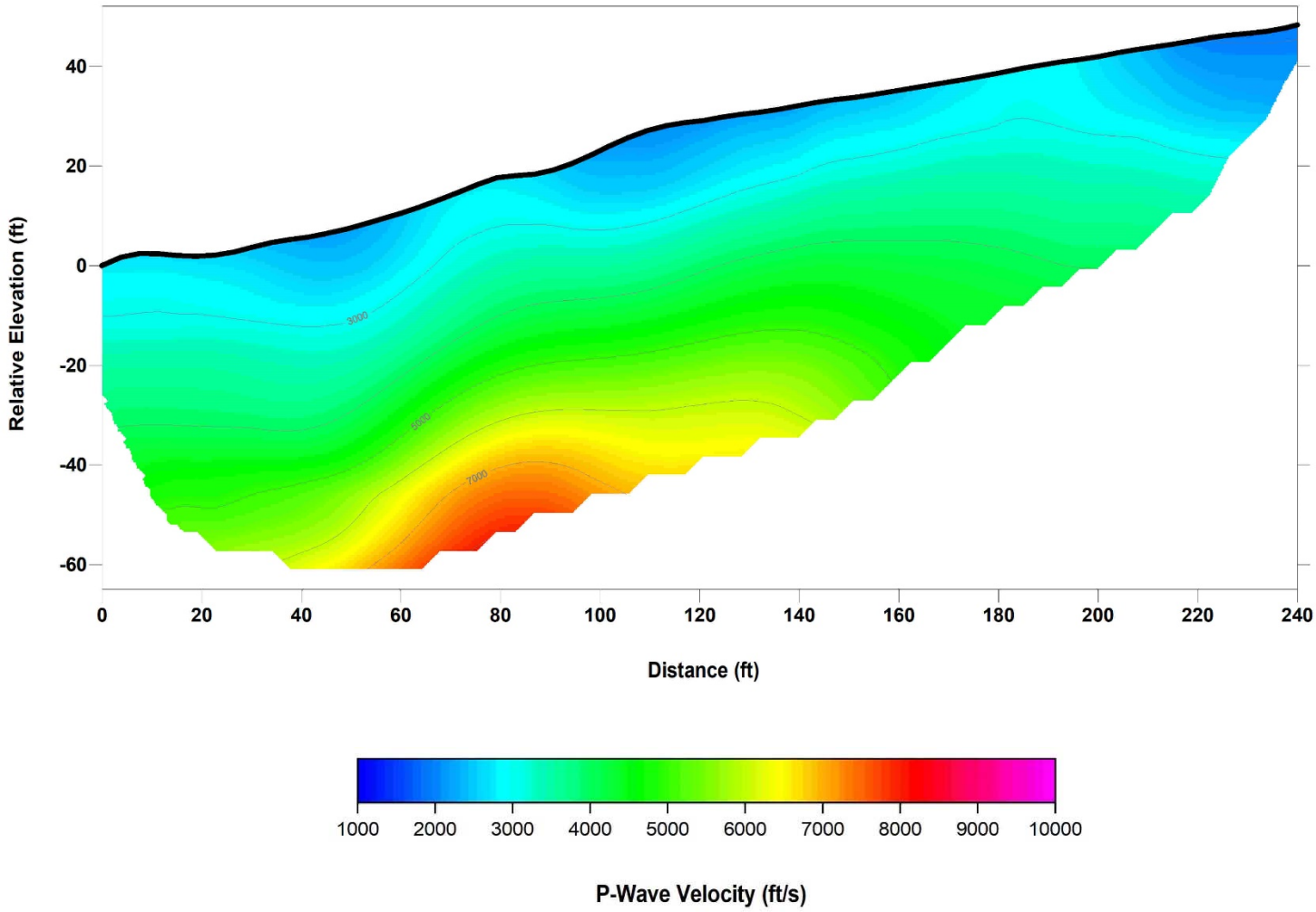


SEISMIC PROFILE SL-2	Golden Meadows Tank Exploration Menifee, California Project No.: 121058SWG | Date: 03/21	ATLAS Figure 4b

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-3

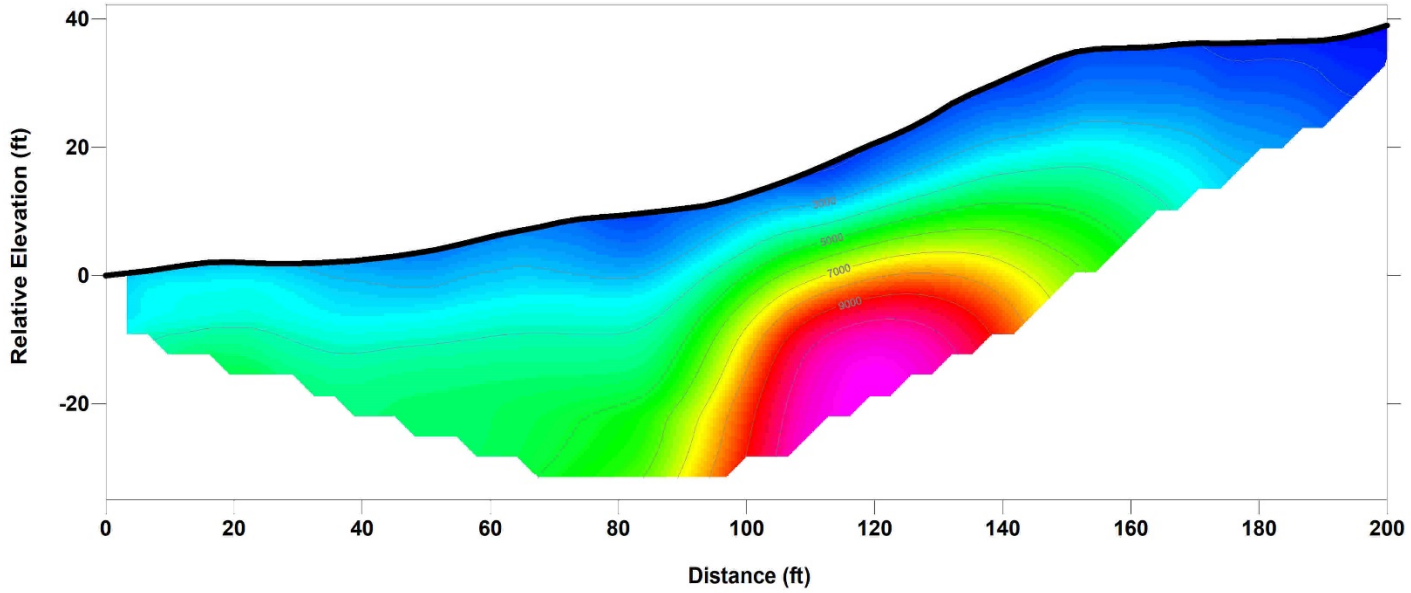


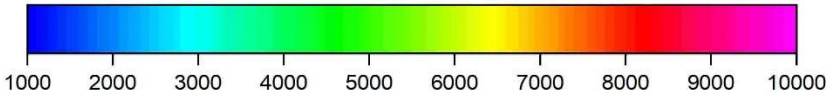
SEISMIC PROFILE SL-3	Golden Meadows Tank Exploration Menifee, California	ATLAS Figure 4c
	Project No.: 121058SWG | Date: 03/21	

Note: Contour Interval = 1,000 feet per second

TOMOGRAPHY MODEL

SL-4





SEISMIC PROFILE SL-4	Golden Meadows Tank Exploration Menifee, California	ATLAS Figure 4d
	Project No.: 121058SWG | Date: 03/21	

Note: Contour Interval = 1,000 feet per second

APPENDIX C

Site-Specific Seismic Coefficients

Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

October 9, 2017

Project No. 11813.001

RICHLAND PLANNED COMMUNITIES, INC
3161 Michelson Drive, Suite 425
Irvine, California 92612

Attention: Mr. Brian Hardy

Subject: Results of Onsite Percolation/Infiltration Testing
Proposed Storm Water Infiltration Basins
Golden Meadows, Tract 31194-1, -2, &-3
City of Menifee, Riverside County, California

References: *Design Handbook for Low Impact Development Best Management Practices, Riverside County Flood Control and Water Conservation District (District), dated September 2011.*

Rough Grading Plan for TR. No. 31194-1, TR. No. 31194-2, TR. No. 31194-3, TR. No. 31194, Golden Meadows, Sheet 16, by Hunsaker and Associates, (undated).

Geotechnical Review of Rough Grading Plans, Tract 31194, Menifee, County of Riverside, California, by Leighton and Associates, Inc., PN. 110712-002, dated January 30, 2004.

In accordance with your request and authorization, we are pleased to provide this report presenting the results of field percolation testing for the proposed storm water infiltration basins associated with the subject Tract. The location of field tests was primarily dictated by Hunsaker and Associates, Inc.

PURPOSE AND SCOPE OF WORK

The purpose of our testing was to determine the infiltration rates of onsite soils with respect to the proposed storm water retention basins as depicted on the referenced rough grading plans. Services provided for this study consisted of the following:

- Drilling, sampling and logging of one exploratory boring within the proposed storm water basin area.

- Field percolation testing at 3 locations within the basin location in accordance with the procedures outlined in District's Design Handbook, referenced above. One test was performed at approximately 12 inches bgs and one at approximately 5 feet bgs in the cut area of the basin. One additional percolation/infiltration test was performed at a depth of 9 feet to verify permeability of underlying bedrock.
- Compilation of this report that presents the results of our field percolation/infiltration testing.

SITE DESCRIPTION

The proposed residential development (Tract 31194) is located southeast of Evans Road and Garbani Road in Menifee, California. The site is generally undeveloped and appeared to be used for agricultural purposes.

Topographically, the central and southeastern portions of the site are relatively flat lying while the northern region of the property is characterized by relatively steep hills. A small, northwest-trending drainage channel extends through the northwestern and central portion of the property. A rock knoll also exists near the southeast corner of the property. Site elevations range from approximately 1,720 feet above mean sea level (msl) in the northeastern corner of the site to approximately 1,500 feet (msl) at the northwestern portion of the site.

FIELD EXPLORATION

Our field exploration consisted of excavating one deep geotechnical boring and three percolation tests on October 4, 2017 utilizing a truck mounted CME 75 drill rig equipped with an 8-inch hollow-stem auger. The exploratory boring was logged and sampled to a minimum depth of 12 feet below existing surface (encountered refusal). Representative samples were collected for further field and laboratory classification. A staff geologist from our office logged and observed all excavations. The locations of the exploratory borings and percolation test holes are shown on Figure 1. The logs of the exploratory borings are included in Appendix A.

SOILS AND GROUNDWATER CONDITIONS

Based on the results of this exploration and review of our previous geotechnical investigation reports, the site is underlain by granitic bedrock which is in turn mantled with a variable thickness of alluvial deposits. Within the proposed storm water basin area,

granitic bedrock was encountered in our Boring LB-1 at depth of approximately 7 feet below ground surface. Based on this exploration and previous investigations it is our opinion that historic groundwater does not exist within 10 feet below bottom of basin.

TEST RESULTS

The percolation/infiltration tests were performed in accordance with the procedures of Section 2.3 of the Riverside County Flood Control and Water Conservation District Design Handbook (RCFC&WCD, 2011). Results reported below are the most conservative reading in minutes per inch drop. The infiltration rates were estimated using the "Porchet Method". Field test data are included in Appendix A.

Summary of Infiltration Test Results

Test Hole #	Ex. Ground Surface Elev. (ft)	Depth BGS (ft)	Infiltration Rate (in/hr)	Soil Description
P-1	1535	9.0	1.35	Well-graded Sand (SW)/ Decomposed Granitic Rock
P-2	1534.5	4.0	0.24	Silty sand (SM) Alluvium
P-3	1531.5	1.0	0.10	Silty sand (SM) / Alluvium

CONCLUSIONS AND RECOMMENDATIONS

Based on the above, we recommend that the proposed basins be sized/designed using an average infiltration rate of 0.12 in/hr if bottom of basin is at elevation 1530 to 1531. No factor of safety was applied to this recommended average infiltration rate.

LIMITATIONS

This report was based in part on data obtained from a limited number of observations, soil excavations, samples and tests. Such information is, by necessity, incomplete. The nature of many sites is such that differing soil or geologic conditions can be present within small distances and under varying climatic conditions. Changes in subsurface conditions can and do occur over time. Please notify the engineer if event conditions encountered during construction are different than those described or reflected in this report.

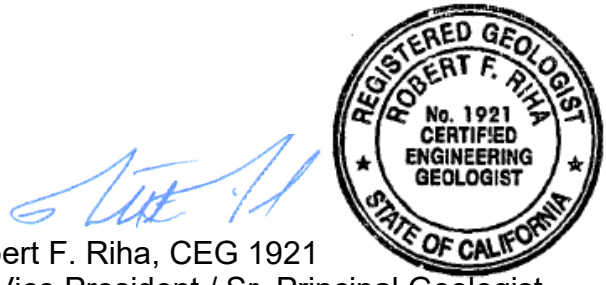
This report was prepared for the sole use of Client and their design team, for application to design of the proposed infiltration basins, in accordance with generally accepted geotechnical engineering practices at this time in California. In addition, since this is subject to review by Riverside County, we recommend that data in this report be only used in the design of this project after review and approval by County, where applicable. Any premature (before County approval) or unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton.

If you have any question, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LEIGHTON AND ASSOCIATES, INC.

Simon I. Saiid, GE 2641
Principal Engineer

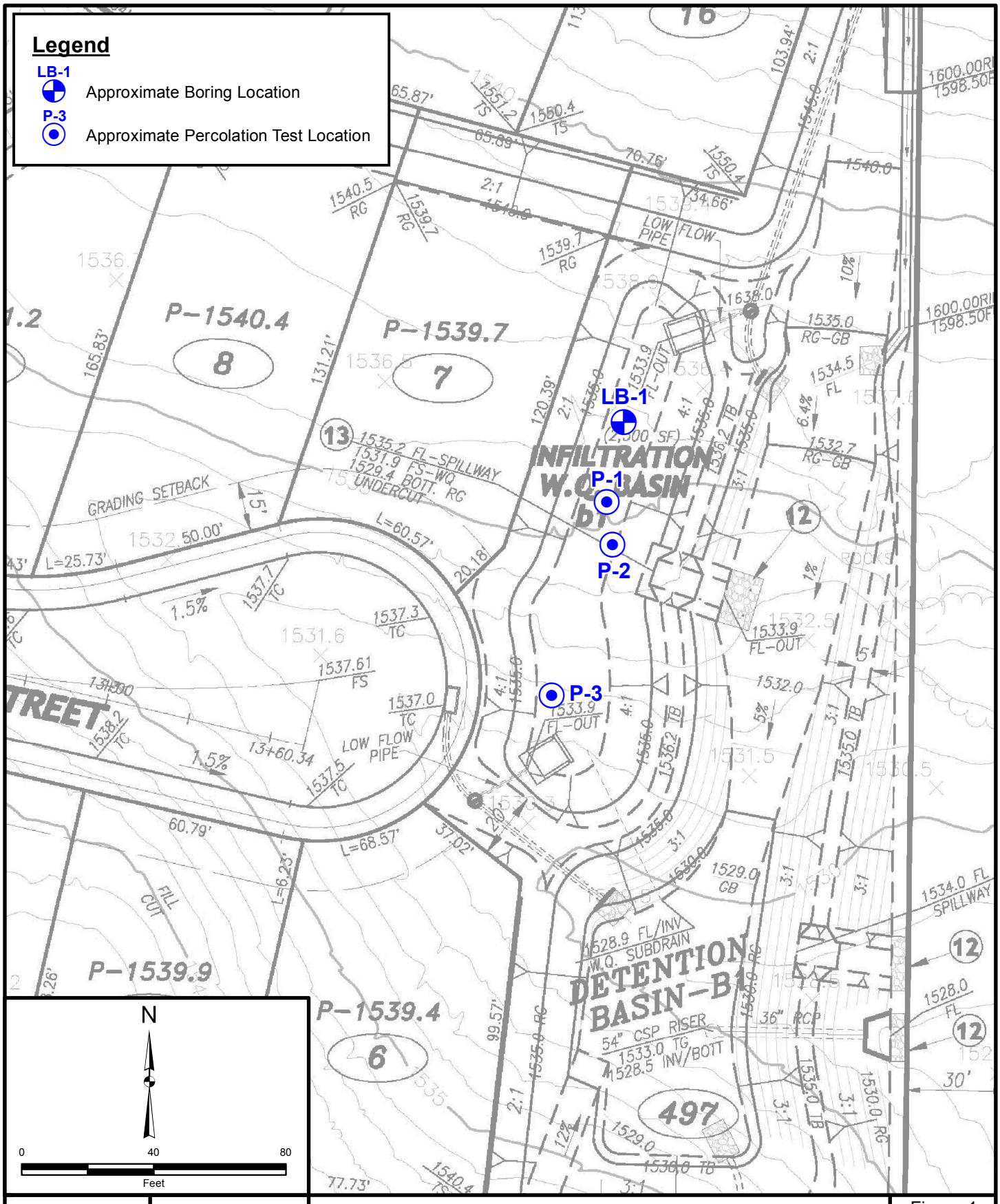


Robert F. Riha, CEG 1921
Sr. Vice President / Sr. Principal Geologist

Attachments: Figure 1 – Boring Location Plan
Appendix A – Perc Data Test Sheets & Log of Exploratory Borings

Distribution: (1) Addressee (one PDF copy via email)
(1) Hunsaker & Associates

Leighton



Project: 11813.001	Eng/Geol: SIS/RFR
Scale: 1 " = 40 '	Date: October 2017

Base Map: Bing Maps 2017
Thematic Information: Leighton
Author: (mmurphy)

BORING LOCATION MAP

Golden Meadows - Tract 31194
Richland Planned Communities
Menifee, California

Figure 1

Leighton

Map Saved as V:\Drafting\11813\001\Maps\11813-001_F02_BLM_2017-10-06.mxd on 10/9/2017 7:51:11 AM

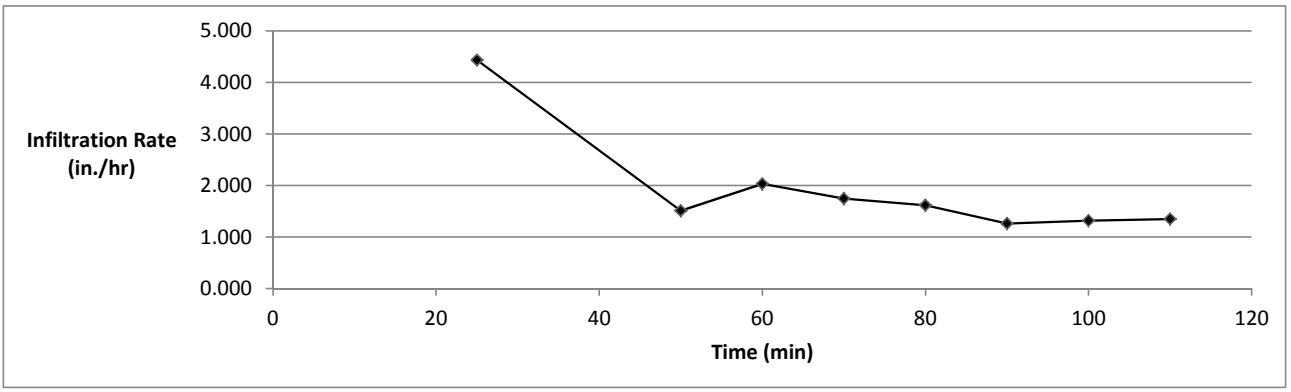
APPENDIX A

Percolation Data Sheets

Log of Exploratory Borings

Test Hole Number:	P-1	Project	Golden Meadows	
Date Excavated:	10/4/2017	Project Number	11813.001	
Tested by:	BSS	Date Tested	10/6/2017	
Soil Unit:	Granitic Bedrock (Kgr)	Depth of Test Hole (in.)	96	
USCS Soil Type:	Grayish Brown SAND with Silt	Diameter (in.)	8	Sunny ~90 °

Time	Δt (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					inches/hour*	minute/inch
8:18:00	25.00	69.50	87.50	18.00	4.431	1.389
8:48:00						
8:48:00	25.00	69.50	77.25	7.75	1.511	3.226
9:18:00						
9:18:00	10.00	74.00	77.75	3.75	2.034	2.667
9:48:00						
9:48:00	10.00	74.00	77.25	3.25	1.743	3.077
10:18:00						
10:18:00	10.00	74.25	77.25	3.00	1.618	3.333
10:48:00						
10:48:00	10.00	75.50	77.75	2.25	1.263	4.444
11:18:00						
11:18:00	10.00	74.00	76.50	2.50	1.319	4.000
11:48:00						
11:48:00	10.00	74.50	77.00	2.50	1.348	4.000
12:18:00						



* Based on Prochet Method

Percolation Test Data

P-1

Project Number: 11813.001

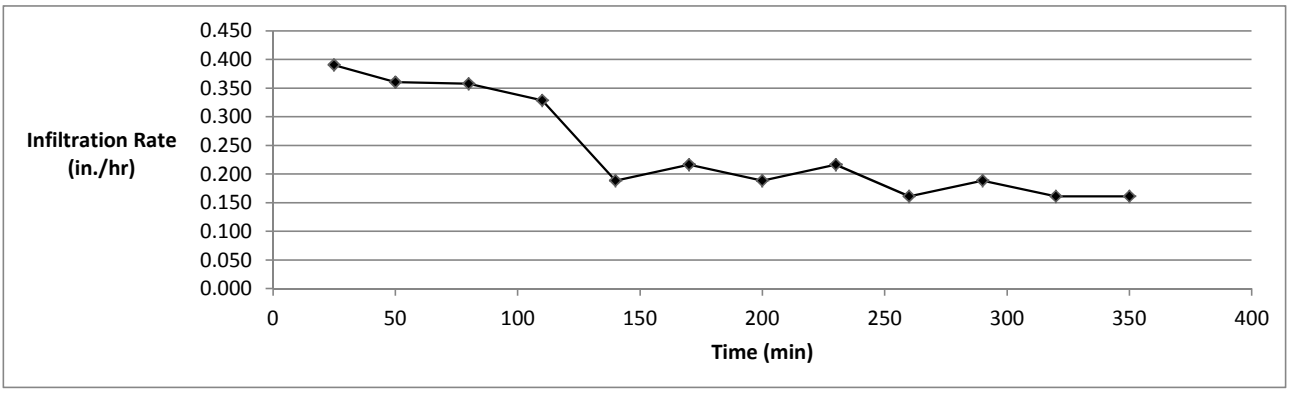
Project Name: *Golden Meadows*

Date: Oct-17

Leighton

Test Hole Number:	P-2	Project	Golden Meadows	
Date Excavated:	10/4/2017	Project Number	11813.001	
Tested by:	BSS	Date Tested	10/6/2017	
Soil Unit:	Alluvium (Qal)	Depth of Test Hole (in.)	48	
USCS Soil Type:	Brown Silty SAND	Diameter (in.)	8	Sunny ~90 °

Time	Δt (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					inches/hour*	minute/inch
9:22:00	25.00	18.00	20.50	2.50	0.390	10.000
9:47:00						
9:47:00	25.00	12.00	14.75	2.75	0.360	9.091
10:12:00						
10:12:00	30.00	12.00	15.25	3.25	0.357	9.231
10:42:00						
10:42:00	30.00	12.00	15.00	3.00	0.329	10.000
11:12:00						
11:12:00	30.00	12.00	13.75	1.75	0.189	17.143
11:42:00						
11:42:00	30.00	12.00	14.00	2.00	0.216	15.000
12:12:00						
12:12:00	30.00	12.00	13.75	1.75	0.189	17.143
12:42:00						
12:42:00	30.00	12.00	14.00	2.00	0.216	15.000
13:12:00						
13:12:00	30.00	12.00	13.50	1.50	0.161	20.000
13:42:00						
13:42:00	30.00	12.00	13.75	1.75	0.189	17.143
14:12:00						
14:12:00	30.00	12.00	13.50	1.50	0.161	20.000
14:42:00						
14:42:00	30.00	12.00	13.50	1.50	0.161	20.000
15:12:00						



* Based on Prochet Method

Percolation Test Data

P-2

Project Number: 11813.001

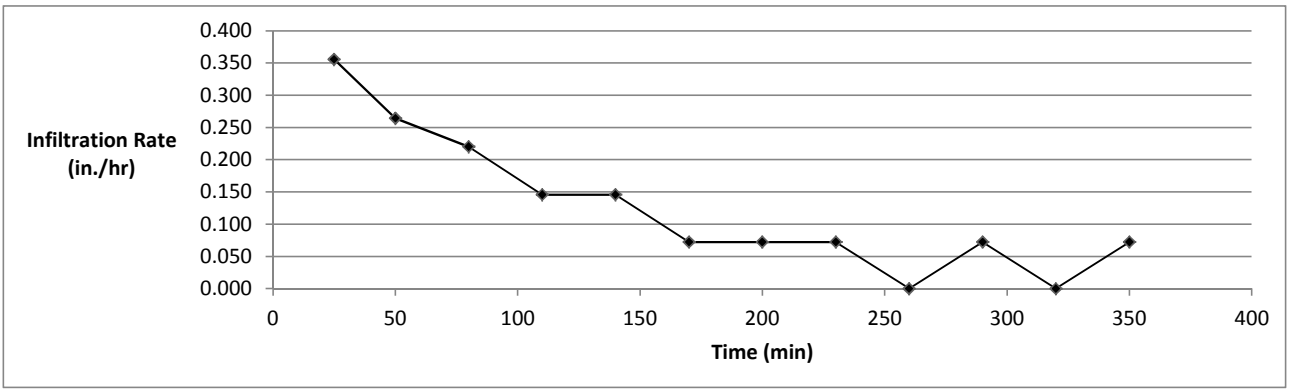
Project Name: *Golden Meadows*

Date: Oct-17

Leighton

Test Hole Number:	P-3	Project	Golden Meadows	
Date Excavated:	10/4/2017	Project Number	11813.001	
Tested by:	BSS	Date Tested	10/6/2017	
Soil Unit:	Alluvium (Qal)	Depth of Test Hole (in.)	12	
USCS Soil Type:	Brown Silty SAND	Diameter (in.)	8	Sunny ~90 °

Time	Δt (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					inches/hour*	minute/inch
9:24:00	25.00	0.00	1.00	1.00	0.356	25.000
9:49:00						
9:49:00	25.00	0.00	0.75	0.75	0.264	33.333
10:14:00						
10:14:00	30.00	0.00	0.75	0.75	0.220	40.000
10:44:00						
10:44:00	30.00	0.00	0.50	0.50	0.145	60.000
11:14:00						
11:14:00	30.00	0.00	0.50	0.50	0.145	60.000
11:44:00						
11:44:00	30.00	0.00	0.25	0.25	0.072	120.000
12:14:00						
12:14:00	30.00	0.00	0.25	0.25	0.072	120.000
12:44:00						
12:44:00	30.00	0.00	0.25	0.25	0.072	120.000
13:14:00						
13:14:00	30.00	0.00	0.00	0.00	0.000	N/A
13:44:00						
13:44:00	30.00	0.00	0.25	0.25	0.072	120.000
14:14:00						
14:14:00	30.00	0.00	0.00	0.00	0.000	N/A
14:44:00						
14:44:00	30.00	0.00	0.25	0.25	0.072	120.000
15:14:00						



* Based on Prochet Method

Percolation Test Data

P-3

Project Number: 11813.001

Project Name: *Golden Meadows*

Date: Oct-17

Leighton

GEOTECHNICAL BORING LOG LB-1

Project No.	11813.001	**Date Drilled**	10-4-17
Project	Golden Meadows	**Logged By**	BSS
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Automatic - 30" Drop	**Ground Elevation**	1535'
Location	See Figure 1	**Sampled By**	BSS

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
1535	0			B-1				SM	**QUATERNARY ALLUVIUM (Qal)** SILTY SAND, medium dense, light brown, dry to moist, fine sand	
				R-1	16 50-6"				dense, reddish brown, moist, fine sand, porous	
1530	5			R-2	50-6"				SILTY SAND, very dense, olive brown, moist, fine to coarse sand, highly weathered rock	
									GRANITIC BEDROCK (Kgr) Difficult drilling	
1525	10			R-3	50-0.5"				Well-graded SAND with SILT, very dense, light olive brown, dry to moist, fine to coarse sand, (no recovery)	
									Drilled to 12' Sampled to 12' Groundwater not encountered Backfilled with soil cuttings (10/4/17)	
1520	15									
1515	20									
1510	25									
1505	30									

The Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG P-1

Project No.	11813.001	**Date Drilled**	10-4-17
Project	Golden Meadows	**Logged By**	BSS
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1535'
Location	See Figure 1	**Sampled By**	BSS

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
1535	0							SM	**QUATERNARY ALLUVIUM (Qal)** SILTY SAND, medium dense, reddish brown, dry to moist, fine to coarse grained sand	
1530	5							SP-SM	Poorly graded SAND with SILT, dense, light olive brown, dry to moist, fine to medium sand, formation	
									GRANITIC BEDROCK (Kgr) Hard drilling Well graded SAND, very dense, light brown, dry to moist, fine to coarse sand	
1525	10								Drilled to 9' Groundwater not encountered Backfilled with soil cuttings (10/4/17)	
1520	15									
1515	20									
1510	25									
1505	30									

SAMPLE TYPES:

B	BULK SAMPLE
C	CORE SAMPLE
G	GRAB SAMPLE
R	RING SAMPLE
S	SPLIT SPOON SAMPLE
T	TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG P-2

Project No.	11813.001	**Date Drilled**	10-4-17
Project	Golden Meadows	**Logged By**	BSS
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1534'
Location	See Figure 1	**Sampled By**	BSS

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							*This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	
	0							SM	**QUATERNARY ALLUVIUM (Qal)** SILTY SAND, dense, brown, moist, fine sand	
1530										
	5								Drilled to 4' Groundwater not encountered Backfilled with soil cuttings (10/5/17)	
1525										
	10									
1520										
	15									
1515										
	20									
1510										
	25									
1505										
	30									

SAMPLE TYPES:

B	BULK SAMPLE
C	CORE SAMPLE
G	GRAB SAMPLE
R	RING SAMPLE
S	SPLIT SPOON SAMPLE
T	TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG P-3

Project No.	11813.001	**Date Drilled**	10-4-17
Project	Golden Meadows	**Logged By**	BSS
Drilling Co.	Martini Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1531'
Location	See Figure 1	**Sampled By**	BSS

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							*This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	
1530	0							SM	**QUATERNARY ALLUVIUM (Qal)** SILTY SAND, loose, light brown, dry, fine sand	
									Total Depth 1' Groundwater not encountered Backfilled with soil cuttings (10/5/17)	
1525	5									
1520	10									
1515	15									
1510	20									
1505	25									
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

October 31, 2012

Project No. 110712-008

RICHLAND COMMUNITIES, INC
4100 NEWPORT PLACE DRIVE
Newport Beach, CA 92672

Attention: Mr. Mike Byer

Subject: Results of Onsite Percolation Testing
Proposed Storm Water Infiltration Basins
Golden Meadows, Tract 31194
City of Menifee, Riverside County, California

References: *Design Handbook for Low Impact Development Best Management Practices, Riverside County Flood Control and Water Conservation District (District), dated September 2011.*

Various Site/Drainage Plans, Tentative Tract 31194, by Hunsaker and Associates, (undated).

Geotechnical Review of Rough Grading Plans, Tract 31194, Menifee, County of Riverside, California, by Leighton and Associates, Inc., PN. 110712-002, dated January 30, 2004.

In accordance with your request and authorization, Leighton and Associates, Inc. (Leighton) is pleased to provide this report presenting the results of our percolation testing for the proposed storm water infiltration basins associated with the subject Tract. The location of field tests was primarily dedicated by Hunsaker and Associates Tentative Tract map, site accessibility and/or prevailing subsurface conditions during field testing.

PURPOSE AND SCOPE OF WORK

The purpose of our testing was to determine the infiltration rates of onsite soils with respect to the proposed storm water retention basins as depicted on the referenced rough grading plans. Services provided for this study consisted of the following:

- Drilling, sampling and logging of two exploratory borings within the proposed storm water basin areas.
- Field percolation testing at 4 locations within park site (Lot 488) and one location within park site/basin (Lot 487) in accordance with the procedures outlined in District's Design Handbook, referenced above.
- Compilation of this report that presents the results of our percolation/infiltration testing and laboratory test results.

SITE DESCRIPTION

The proposed residential development (Tract 31194) is located southeast of Evans Road and Garbani Road in Menifee, California. The site is generally undeveloped and appeared to be used for agricultural purposes.

Topographically, the central and southeastern portions of the site are relatively flat lying while the northern region of the property is characterized by relatively steep hills. A small, northwest-trending drainage channel extends through the northwestern and central portion of the property. A knoll also exists near the southeast corner of the property. Site elevations range from approximately 1,720 feet above mean sea level (msl) in the northeastern corner of the site to approximately 1,500 feet (msl) at the northwestern portion of the site.

SUBSURFACE INVESTIGATION

Our field investigation consisted of excavating two deep exploratory borings and five percolation tests on October 23, 2012 utilizing a truck mounted CME 75 drill rig equipped with an 8-inch hollow-stem auger. The exploratory borings were continuously logged to a minimum depth of 10 feet below bottom of the proposed storm water basins unless encountering refusal. Representative samples were collected for further field and laboratory classification. A staff geologist from our office logged and observed all excavations. The locations of the exploratory borings and percolation test holes are shown on Figure 2. The logs of the exploratory borings are included in Appendix A.

SOILS AND GROUNDWATER CONDITIONS

Based on the results of this study and review of our previous geotechnical investigation report referenced above, the site is underlain by granitic bedrock which is in turn mantled

with a variable thickness of alluvial deposits. Within Lot 488, alluvium was encountered in our Boring B-1 to a depth of approximately 8 feet below ground surface (BGS). These alluvial soils are classified as silty sand (SM) with gravel. Within Lot 487, the alluvium extends to a depth of approximately 11 feet BGS. Groundwater was not encountered in any of our borings or within a depth of 10 feet below bottom of either basin.

PERCOLATION TEST RESULTS

The percolation tests were performed in accordance with the procedures of Section 2.3 of the Riverside County Flood Control and Water Conservation District Design Handbook (RCFC&WCD, 2011). Results reported below are the most conservative reading in minutes per inch drop. The infiltration rates were estimated using the Prochet Method. Field test data are included in Appendix A.

Summary of Percolation/Infiltration Test Results

Location	Test Hole #	Ex. Ground Surface Elev. (ft)	Depth BGS (ft)	Percolation Rate (min/in)	Infiltration Rate (in/hr)	Soil Description
Lot 488	P-1	1523	9.0	42.9	0.12	Weathered Granitic Rock
	P-2	1527	9.5	9.1	0.67	Silty sand (SM) Alluvium/Rock
	P-3	1520	2.5	8.1	1.15	Silty sand (SM) / Alluvium/ Granitic Rock
	P-4	1518	2.5	4.2	2.14	Silty sand (SM) / Alluvium
Lot 487	P-5	1518	2.5	4.5	1.86	Clayey sand (SC) / Alluvium

CONCLUSIONS AND RECOMMENDATIONS

As summarized above, the locations tested appear suitable for onsite infiltration provided bottom of basins is within 3 feet of exiting ground surface (rates varying from 1.15 to 2.14 in/hr). The proposed "flow diversion" structures are likely to be embedded in weathered granitic rock (~9 to 10 feet BGS) and the infiltration rates should be expected to range from 0.12 to 0.67 in/hr based on tests P-1 and P-2.

Based on the above, we recommend that the proposed basins be sized/designed to allow for at least 5 feet of permeable alluvial soils to remain below the bottom of basins. As such, the bottom of basins at the locations tested should not extend more than 3 feet BGS.

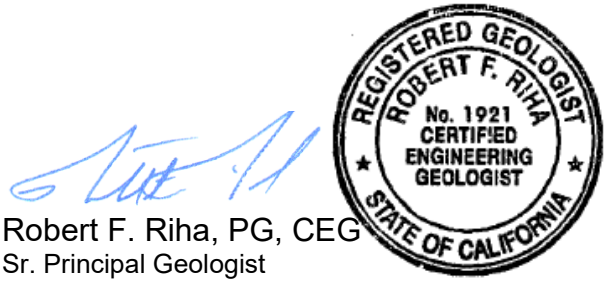
LIMITATIONS

This report was based in part on data obtained from a limited number of observations, soil excavations, samples and tests. Such information is, by necessity, incomplete. The nature of many sites is such that differing soil or geologic conditions can be present within small distances and under varying climatic conditions. Changes in subsurface conditions can and do occur over time. Please notify the engineer if event conditions encountered during construction are different than those described or reflected in this report.

This report was prepared for the sole use of Client and their design team, for application to design of the proposed infiltration basins, in accordance with generally accepted geotechnical engineering practices at this time in California. In addition, since this is subject to review by Riverside County, we recommend that data in this report be only used in the design of this project after review and approval by County, where applicable. Any premature (before County approval) or unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton.

If you have any question, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,
LEIGHTON AND ASSOCIATES, INC.

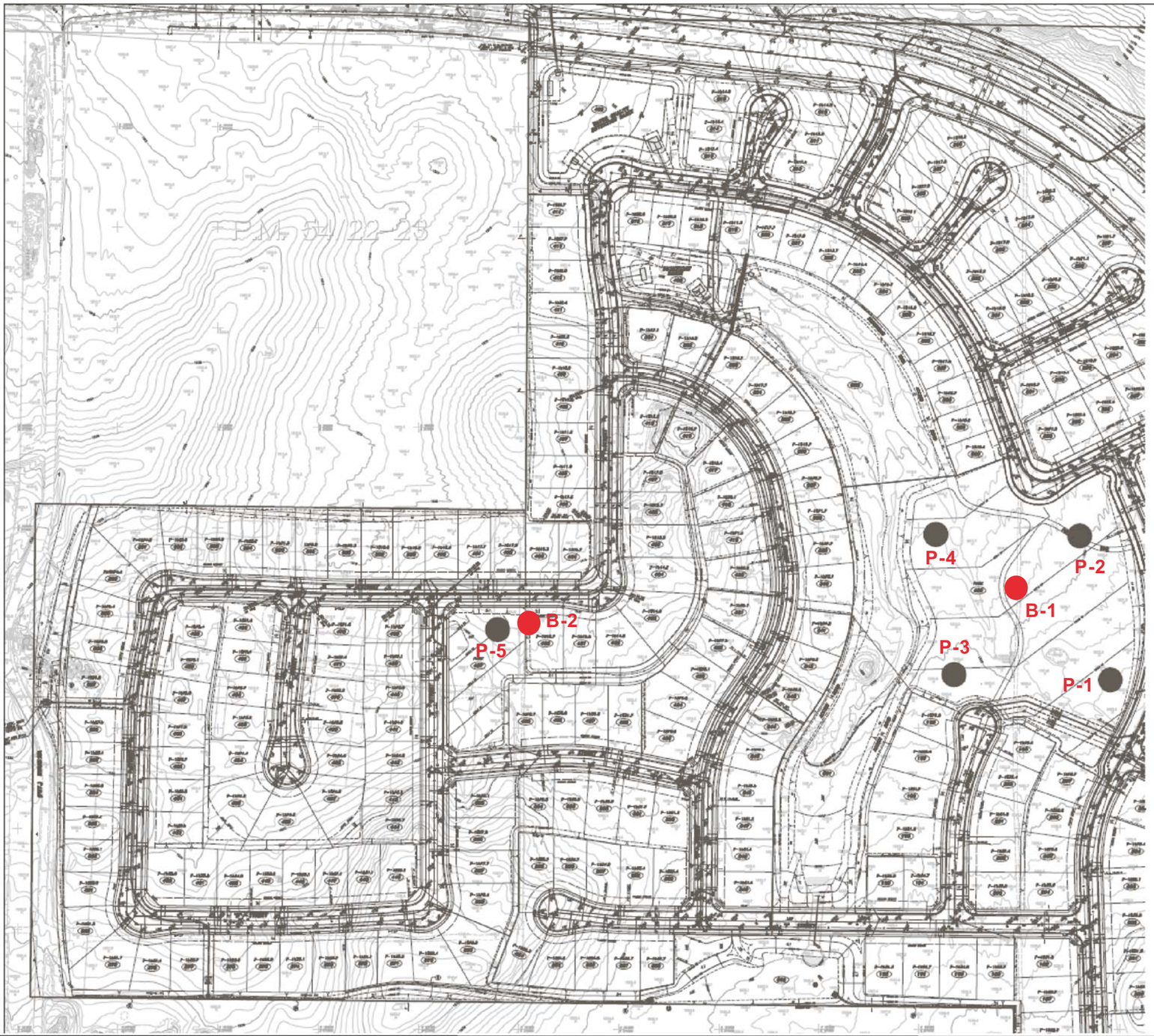


Simon I. Saiid, PE, GE
Principal Engineer
Extension 8013, ssaiid@leightongroup.com

Robert F. Riha, PG, CEG
Sr. Principal Geologist
Extension 8914, rriha@leightongroup.com

Attachments: Figure 1 – Percolation Test Location Plan
Appendix A – Perc Data Test Sheets, Log of Exploratory Borings & Laboratory Test Results

Distribution: (1) Addressee (one PDF copy via email)
(2) Hunsaker & Associates, Attention: Ben Etemadi



N

LEGEND:

B-2 ● Deep Boring Location

P-5 ● Percolation Test Location

Project: 110712-008	Eng/Geol: RFR/SIS
Scale: Not To Scale	Date: October 2012

Drafted by: BSS | Checked by: SIS | Base Map: Hunsaker & Associates

Site Plan
Golden Meadows
Tract 31194
Menifee, Riverside County, CA

FIGURE 1

Leighton

APPENDIX A

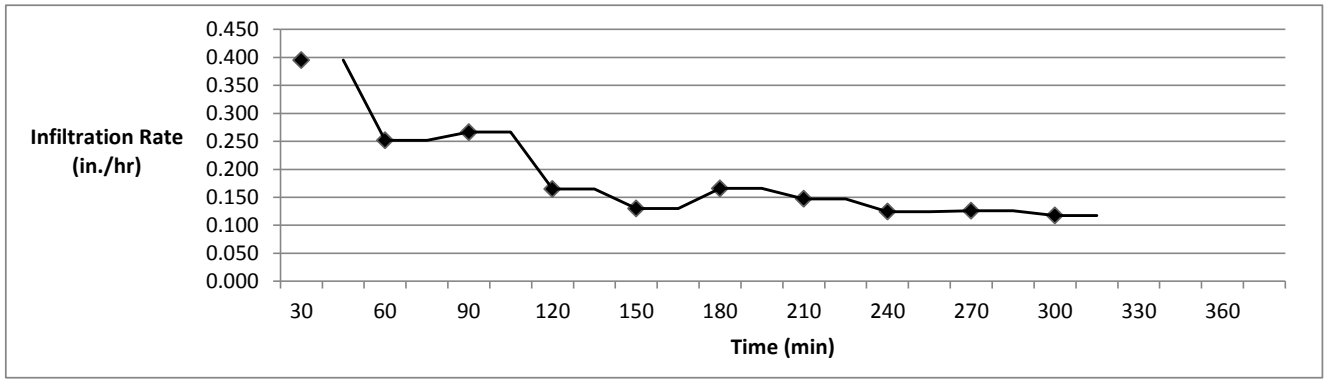
Percolation Data Sheets

Log of Exploratory Borings

Laboratory Test Results / Grain Size Analysis

Test Hole Number:	P-1	Project	Tract 31194	
Date Excavated:	10/23/2012	Project Number	110712-008	
Tested by:	BSS	Date Tested	10/24/2012	
Soil Unit:	Granitic Bedrock	Depth of Test Hole (in.)	108	Ex El ~1523' msl
USCS Soil Type:	Brown Silty Sand with Gravel	Diameter (in.)	9	Sunny ~65 °

Time	Δt (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					inches/hour*	minute/inch
10:32:00	30.00	86.30	84.10	2.20	0.395	13.636
11:02:00						
11:03:00	30.00	84.20	82.70	1.50	0.252	20.000
11:33:00						
11:33:00	30.00	87.30	85.90	1.40	0.266	21.429
12:03:00						
12:04:00	30.00	86.10	85.20	0.90	0.165	33.333
12:34:00						
12:35:00	30.00	86.40	85.70	0.70	0.130	42.857
1:05:00						
1:05:00	30.00	86.30	85.40	0.90	0.166	33.333
1:36:00						
1:36:00	30.00	86.20	85.40	0.80	0.147	37.500
2:06:00						
2:06:00	30.00	85.30	84.60	0.70	0.125	42.857
2:36:00						
2:37:00	30.00	85.60	84.90	0.70	0.126	42.857
3:07:00						
3:07:00	30.00	85.70	85.05	0.65	0.118	46.154
3:37:00						



* Based on Prochet Method

Percolation Test Data

Basin 1

P- 1

Project Number: 110712-008

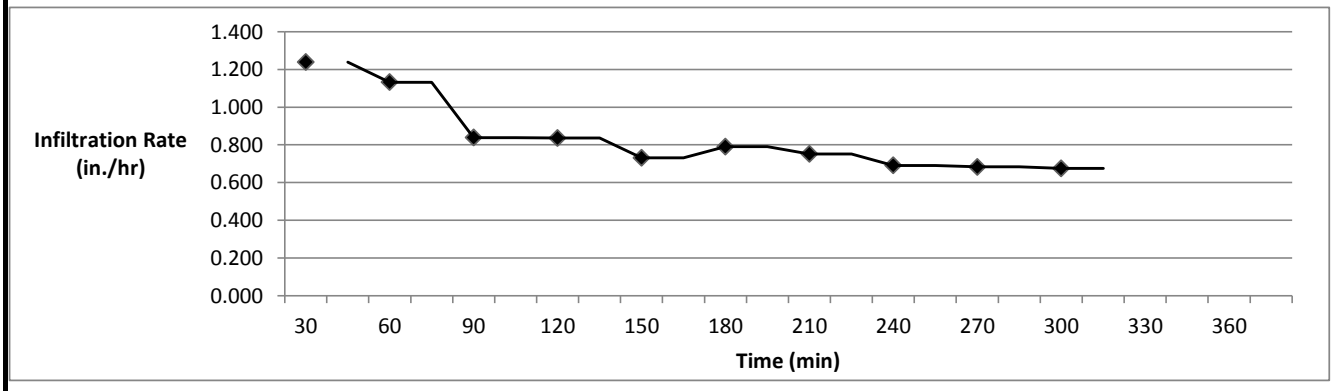
Project Name: *Golden Meadows*

Date: Oct-12

Leighton

Test Hole Number:	P-2	Project	Tract 30972	
Date Excavated:	10/23/2012	Project Number	110712-008	
Tested by:	BSS	Date Tested	10/24/2012	
Soil Unit:	Alluvium (Qal)/Kgr	Depth of Test Hole (in.)	114	Ex El ~1520' msl
USCS Soil Type:	Dark Brown Silty Sand (SM)	Diameter (in.)	9	Sunny ~75 °

Time	Δt (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					Inches/hour*	minute/inch
10:20:00	30.00	96.20	89.80	6.40	1.239	4.688
10:50:00						
10:50:00	30.00	96.10	90.30	5.80	1.132	5.172
11:20:00						
11:22:00	30.00	96.30	92.20	4.10	0.839	7.317
11:52:00						
11:53:00	30.00	97.20	93.30	3.90	0.836	7.692
12:23:00						
12:24:00	30.00	95.30	91.60	3.70	0.730	8.108
12:54:00						
12:54:00	30.00	96.50	92.70	3.80	0.790	7.895
1:24:00						
1:25:00	30.00	96.50	92.90	3.60	0.752	8.333
1:55:00						
1:56:00	30.00	96.40	93.10	3.30	0.691	9.091
2:26:00						
2:27:00	30.00	96.45	93.20	3.25	0.683	9.231
2:57:00						
2:57:00	30.00	96.50	93.30	3.20	0.674	9.375
3:27:00						



*Based on Prochet Method

Percolation Test Data
Basin 1
P-2

Project Number: 110712-008

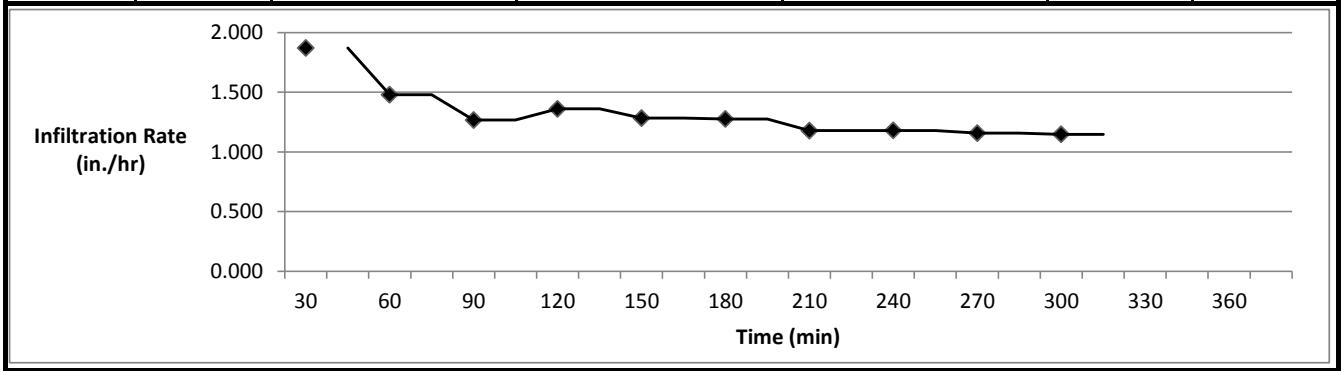
Project Name: *Golden Meadows*

Date: Oct-12

Leighton

Test Hole Number:	P-3	Project	Tract 30972	
Date Excavated:	10/23/2012	Project Number	110712-008	
Tested by:	BSS	Date Tested	10/24/2012	
Soil Unit:	Alluvium (Qal)	Depth of Test Hole (in.)	30	Ex El ~1520.5' msl
USCS Soil Type:	Brown Silty Sand with Gravel	Diameter (in.)	8	Sunny ~75 °

Time	Δt (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					Inches/hour*	minute/inch
10:43:00	30.00	22.00	15.90	6.10	1.870	4.918
11:13:00						
11:14:00	30.00	21.20	16.30	4.90	1.479	6.122
11:44:00						
11:45:00	30.00	21.10	17.00	4.10	1.266	7.317
12:15:00						
12:16:00	30.00	21.50	17.20	4.30	1.360	6.977
12:46:00						
12:47:00	30.00	21.00	16.80	4.20	1.282	7.143
1:17:00						
1:17:00	30.00	21.20	17.10	4.10	1.276	7.317
1:47:00						
1:48:00	30.00	21.00	17.20	3.80	1.178	7.895
2:18:00						
2:18:00	30.00	21.30	17.60	3.70	1.179	8.108
2:48:00						
2:49:00	30.00	21.20	17.55	3.65	1.156	8.219
3:19:00						
3:19:00	30.00	21.25	17.65	3.60	1.147	8.333
3:49:00						



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Percolation Test Data

Basin 1

P-3

Project Number: 110712-008

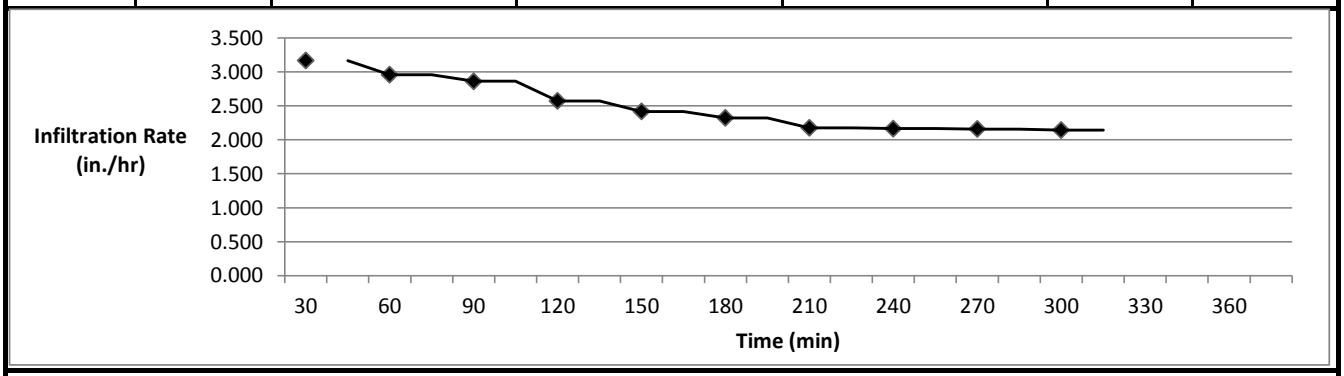
Project Name: *Golden Meadows*

Date: Oct-12

Leighton

Test Hole Number:	P-4	Project	Tract 31194	
Date Excavated:	10/23/2012	Project Number	110712-008	
Tested by:	BSS	Date Tested	10/24/2012	
Soil Unit:	Alluvium (Qal)	Depth of Test Hole (in.)	30	Ex El ~1517' msl
USCS Soil Type:	Brown Silty Sand (SM)	Diameter (in.)	8	Sunny ~75 °

Time	Δt (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					Inches/hour*	minute/inch
10:45:00	30.00	23.00	11.20	11.80	3.168	2.542
11:15:00						
11:16:00	30.00	22.30	10.90	11.40	2.961	2.632
11:46:00						
11:47:00	30.00	22.40	11.70	10.70	2.863	2.804
12:17:00						
12:18:00	30.00	22.20	12.90	9.30	2.574	3.226
12:48:00						
12:49:00	30.00	22.30	13.90	8.40	2.417	3.571
1:19:00						
1:20:00	30.00	22.60	14.90	7.70	2.325	3.896
1:50:00						
1:51:00	30.00	22.50	15.40	7.10	2.176	4.225
2:21:00						
2:22:00	30.00	22.30	15.10	7.20	2.165	4.167
2:52:00						
2:53:00	30.00	22.40	15.30	7.10	2.160	4.225
3:23:00						
3:23:00	30.00	22.30	15.20	7.10	2.143	4.225
3:53:00						



*Based on Prochet Method

Percolation Test Data
Basin 1
P-4

Project Number: 110712-008

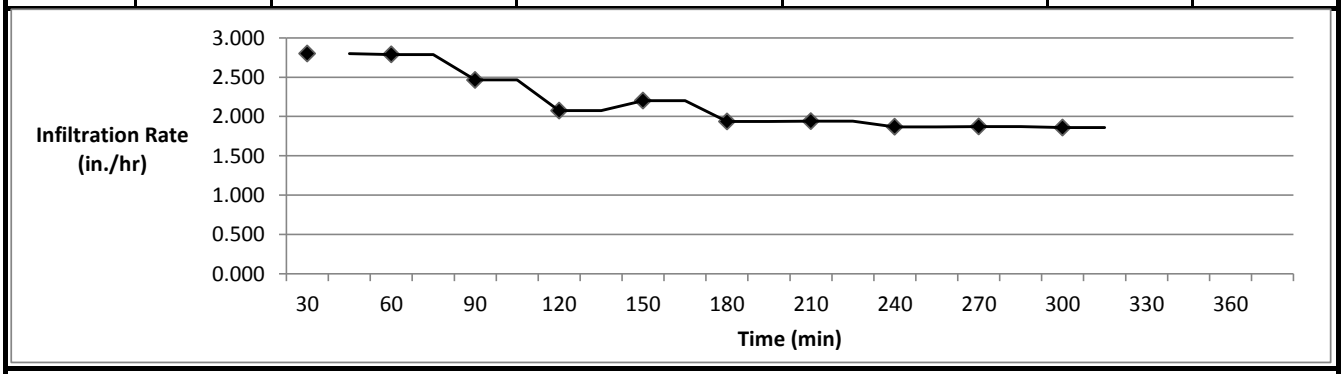
Project Name: *Golden Meadows*

Date: Oct-12

Leighton

Test Hole Number:	P-5	Project	Tract 31194	
Date Excavated:	10/23/2012	Project Number	110712-008	
Tested by:	JTD	Date Tested	12/24/2012	
Soil Unit:	Alluvium (Qal)	Depth of Test Hole (in.)	30	Ex El ~1518' msl
USCS Soil Type:	Dark Brown Silty SAND	Diameter (in.)	8	Sunny ~74 °

Time	Δt (min)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					Inches/hour*	minute/inch
10:25:00	30.00	21.50	10.20	11.30	2.799	2.655
10:55:00						
10:55:00	30.00	22.00	11.30	10.70	2.788	2.804
11:25:00						
11:26:00	30.00	22.00	13.10	8.90	2.464	3.371
11:56:00						
11:57:00	30.00	21.00	13.30	7.70	2.074	3.896
12:27:00						
12:27:00	30.00	22.00	14.40	7.60	2.203	3.947
12:57:00						
12:58:00	30.00	21.50	14.80	6.70	1.935	4.478
13:28:00						
13:28:00	30.00	22.00	15.60	6.40	1.939	4.688
13:58:00						
13:58:00	30.00	21.00	14.30	6.70	1.868	4.478
14:28:00						
14:29:00	30.00	21.20	14.60	6.60	1.872	4.545
14:59:00						
14:59:00	30.00	21.10	14.50	6.60	1.859	4.545
15:29:00						



*Based on Prochet Method

Percolation Test Data
Basin 2
P-5

Project Number: 110712-008

Project Name: *Golden Meadows*

Date: Oct-12

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GEOTECHNICAL BORING LOG B-1

Project No.	110712008	**Date Drilled**	10-23-12
Project	Richland Tract 31194	**Logged By**	BSS
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Auto Hammer - 30" Drop	**Ground Elevation**	1518'
Location	See Boring Location Map	**Sampled By**	BSS

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							*This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	
	0									
1515								SM	QUATERNARY ALLUVIUM (Qal) SILTY SAND (SM), medium dense, light yellowish brown, dry, fine sand	
	5								dense, brown, dry to moist	
1510									GRANITIC BEDROCK (Kgr)	
	10			S-1	50-3"			(SM)g	Completely to highly weathered Granitic Rock, breaks into: SILTY SAND with gravel (SM), very dense, light brown, dry, fine to medium sand, weathered (13% fines, 17% gravel)	SA
1505										
	15			S-2	50-1.5"			GP	GRAVEL with silt and sand (GP), very dense, light brown, moist, coarse sand, weathered	
1500									Refusal @ 18' (Bedrock) No Caving or Groundwater Backfilled with Spoils	
	20									
1495										
	25									
1490										
	30									

SAMPLE TYPES:

B	BULK SAMPLE
C	CORE SAMPLE
G	GRAB SAMPLE
R	RING SAMPLE
S	SPLIT SPOON SAMPLE
T	TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG B-2

Project No.	110712008	**Date Drilled**	10-23-12
Project	Richland Tract 31194	**Logged By**	BSS
Drilling Co.	2R Drilling, Inc.	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Auto Hammer - 30" Drop	**Ground Elevation**	1520'
Location	See Boring Location Map	**Sampled By**	BSS

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
1520	0							SM	QUATERNARY ALLUVIUM (Qal) SILTY SAND (SM), medium dense, dark brown, dry to moist, fine sand	
1515	5			S-1	9 18 12			SC	QUATERNARY OLDER ALLUVIUM (Qaol) CLAYEY SAND (SC), stiff, olive brown, moist, weathered (29% fines)	SA
1510	10			S-2	10 19 50-1"				CLAYEY SAND (SC), very dense, olive gray to brown, moist, fine to medium sand GRANITIC BEDROCK (Kgr) Refusal @ 11.1' (Bedrock) No Caving or Groundwater Backfilled with Spoils	
1505	15									
1500	20									
1495	25									
1490	30									

SAMPLE TYPES:

B	BULK SAMPLE
C	CORE SAMPLE
G	GRAB SAMPLE
R	RING SAMPLE
S	SPLIT SPOON SAMPLE
T	TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

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PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS

ASTM D 6913

Project Name:	GOLDEN MEADOWS		Tested By:	JAP	Date: 10/25/12
Project No.:	110712-008		Checked By:	JMB	Date: 10/26/12
Exploration No.:	**B-1**		Depth (feet):	10.0	
Sample No.:	**S-1**				
Soil Identification:	SILTY SAND WITH LITTLE GRAVEL (SM)g, light brown.				

		Moisture Content of Total Air - Dry Soil	
Container No.:	X-35	Wt. of Air-Dry Soil + Cont. (g)	545.2
Wt. of Air-Dried Soil + Cont.(g)	545.2	Wt. of Dry Soil + Cont. (g)	535.5
Wt. of Container (g)	144.2	Wt. of Container No._____ (g)	144.2
Dry Wt. of Soil (g)	391.3	Moisture Content (%)	2.5

After Wet Sieve	Container No.	X-35
	Wt. of Dry Soil + Container (g)	485.4
	Wt. of Container (g)	144.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	341.2

U. S. Sieve Size (in.)	U. S. Sieve Size (mm.)	Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
3"	75.000		100.0
1"	25.000		100.0
3/4"	19.000	0.0	100.0
1/2"	12.500	9.3	97.6
3/8"	9.500	10.8	97.2
#4	4.750	66.3	83.1
#8	2.360	149.0	61.9
#16	1.180	213.8	45.4
#30	0.600	260.3	33.5
#50	0.300	292.9	25.1
#100	0.150	317.9	18.8
#200	0.075	339.4	13.3
PAN			

GRAVEL: **17 %**

SAND: **70 %**

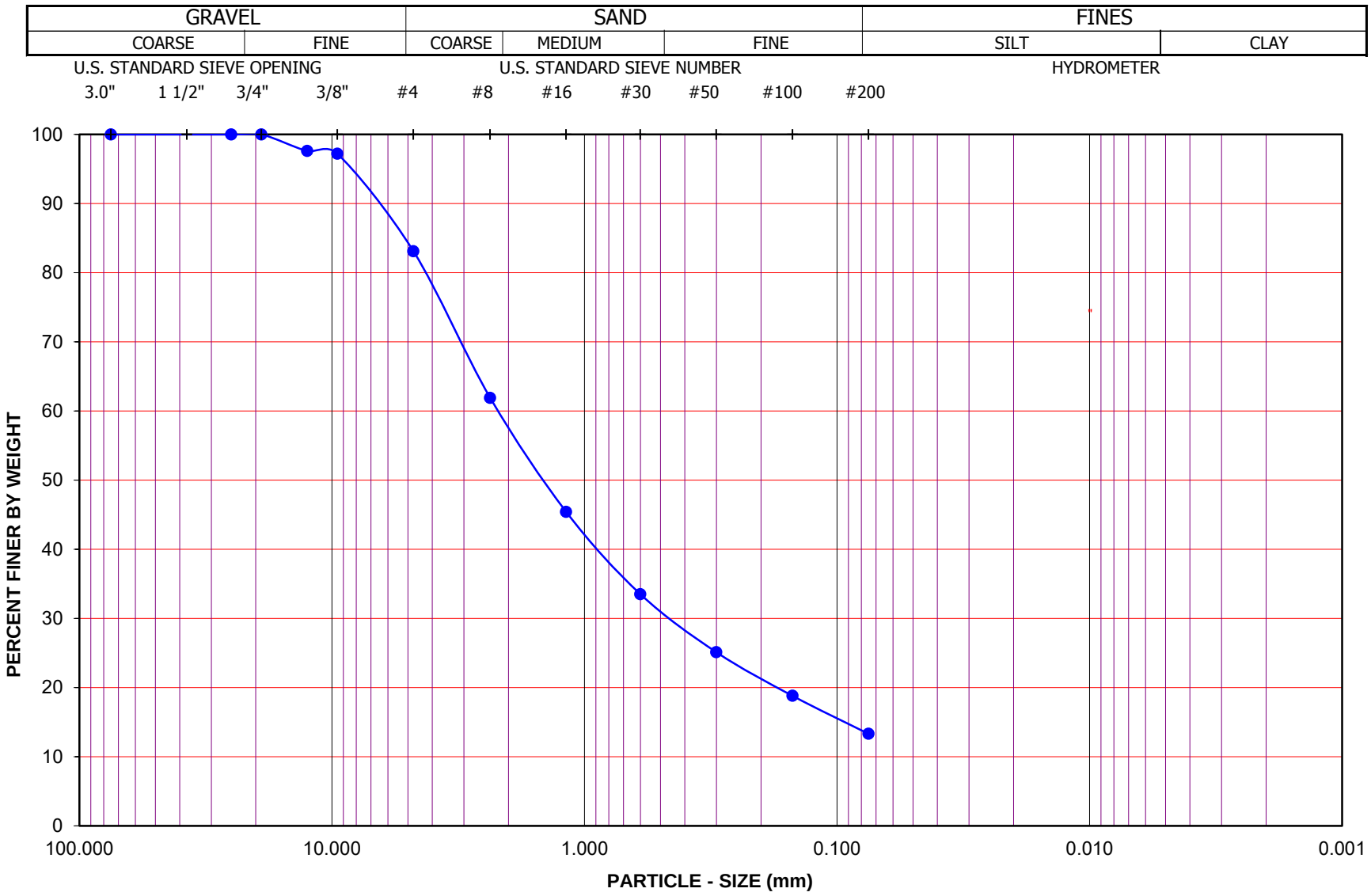
FINES: **13 %**

GROUP SYMBOL: **(SM)g**

Cu = D60/D10 = N/A

Cc = $(D30)^2/(D60*D10)$ = N/A

Remarks: **



Project Name: GOLDEN MEADOWS

Project No.: 110712-008

Exploration No.: B-1 Sample No.: S-1

Depth (feet): 10.0 Soil Type : (SM)g

Soil Identification: SILTY SAND WITH LITTLE GRAVEL (SM)g, light brown.

GR:SA:FI : (%) 17 : 70 : 13

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PARTICLE - SIZE DISTRIBUTION ASTM D 6913

Oct-12

Leighton

PARTICLE-SIZE DISTRIBUTION (GRADATION) of SOILS USING SIEVE ANALYSIS

ASTM D 6913

Project Name:	GOLDEN MEADOWS		Tested By:	JAP	Date: 10/25/12
Project No.:	110712-008		Checked By:	JMB	Date: 10/26/12
Exploration No.:	**B-2**		Depth (feet):	5.0	
Sample No.:	**S-1**				
Soil Identification:	CLAYEY SAND WITH TRACE GRAVEL (SC), yellowish brown.				

		Moisture Content of Total Air - Dry Soil	
Container No.:	KR	Wt. of Air-Dry Soil + Cont. (g)	684.8
Wt. of Air-Dried Soil + Cont.(g)	684.8	Wt. of Dry Soil + Cont. (g)	613.0
Wt. of Container (g)	158.9	Wt. of Container No._____ (g)	158.9
Dry Wt. of Soil (g)	454.1	Moisture Content (%)	15.8

After Wet Sieve	Container No.	KR
	Wt. of Dry Soil + Container (g)	484.8
	Wt. of Container (g)	158.9
	Dry Wt. of Soil Retained on # 200 Sieve (g)	325.9

U. S. Sieve Size (in.)	U. S. Sieve Size (mm.)	Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
3"	75.000		100.0
1"	25.000		100.0
3/4"	19.000		100.0
1/2"	12.500		100.0
3/8"	9.500	0.0	100.0
#4	4.750	12.3	97.3
#8	2.360	83.6	81.6
#16	1.180	158.4	65.1
#30	0.600	216.4	52.3
#50	0.300	260.1	42.7
#100	0.150	296.5	34.7
#200	0.075	324.8	28.5
PAN			

GRAVEL: **3 %**

SAND: **68 %**

FINES: **29 %**

GROUP SYMBOL: **SC**

Cu = D60/D10 = N/A

Cc = $(D30)^2/(D60*D10)$ = N/A

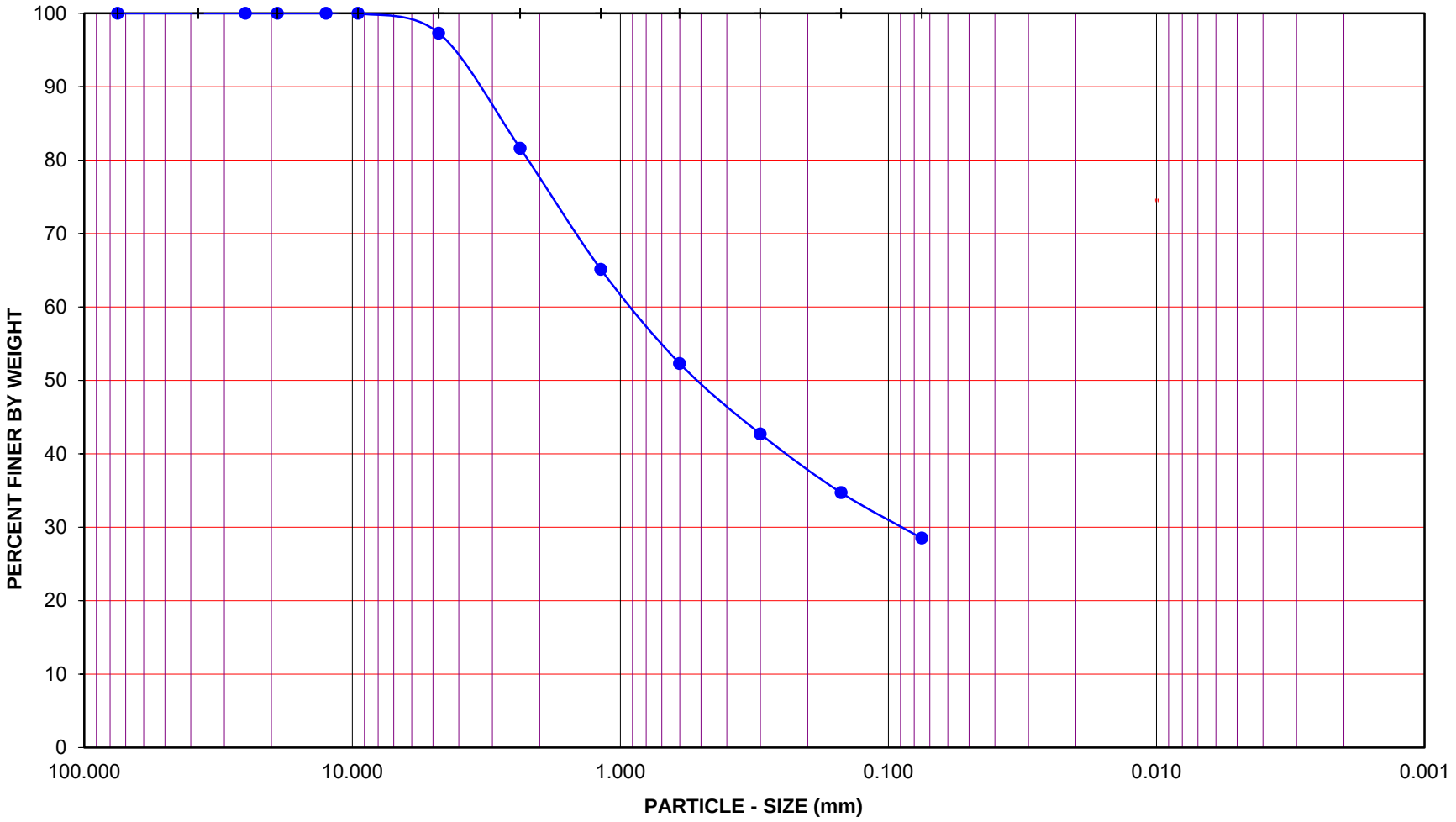
Remarks: **

GRAVEL		SAND			FINES	
COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

U.S. STANDARD SIEVE OPENING: 3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER: #4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: GOLDEN MEADOWS

Project No.: 110712-008

Exploration No.: B-2 Sample No.: S-1

Depth (feet): 5.0 Soil Type : SC

Soil Identification: CLAYEY SAND WITH TRACE GRAVEL (SC), yellowish brown.

GR:SA:FI : (%) 3 : 68 : 29

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

Oct-12

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

NOT APPLICABLE

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

NOT APPLICABLE

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

R 07 W | R 06 W | R 05 W | R 04 W | R 03 W | R 02 W | R 01 W | R 01 E | R 02 E | R 03 E | R 04 E | R 05 E

T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S

06	05	04	03	02	01
07	08	09	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

0.85 MiraLoma
0.61 Riverside North
0.54 RiverSide South
0.68 PigeonPass
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
D85 = 0.60
0.90 HurkeyCreek
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley

Santa Ana River Watershed
Santa Margarita Watershed

JURUPA VALLEY | EASTVALE | NORCO | CORONA | RIVERSIDE | MORENO VALLEY | CALIMESA | BEAUMONT | SAN JACINTO | PERRIS | CANYON LAKE | LAKE ELSINORE | WILDOMAR | MENIFEE | HEMET | MURRIETA | TEMECULA

N

Rain Gage Locations

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Isohyetal Map for the 85th Percentile 24 hour Storm Event

July 2011

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Hunsaker & Associates — Date: Nov 2021

Designed by: Brian Lowell — Case No:

Company Project Number/Name: Golden Meadows - Phase 4 - Major Modification

BMP Identification

BMP NAME / ID: DMA 'A'

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.60 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
A-1 Roof	*412,000*	*Roofs*	*1*	*0.89*	*367504*			
A-2 Driveways	*65,920*	*Concrete or Asphalt*	*1*	*0.89*	*58800.6*			
A-3 Pavement	*658,876*	*Concrete or Asphalt*	*1*	*0.89*	*587717.4*			
A-4 Sidewalk	*140,733*	*Concrete or Asphalt*	*1*	*0.89*	*125533.8*			
A-5 Parkway	*161,310*	*Ornamental Landscaping*	*0.1*	*0.11*	*17818*			
A-6 Slopes	*423,953*	*Ornamental Landscaping*	*0.1*	*0.11*	*46829*			
A-7 Turf	*767,086*	*Ornamental Landscaping*	*0.1*	*0.11*	*84730.8*			
A-8 Natural	*1,428,998*	*Natural (A Soil)*	*0.03*	*0.06*	*89371.2*			
A-9 Basin Bottom	*31,401*	*Natural (A Soil)*	*0.03*	*0.06*	*1963.9*			
A-10 DG Trail	*32,689*	*Decomposed Granite*	*0.4*	*0.28*	*9143.5*			
A-11 Open Space	*139,981*	*Ornamental Landscaping*	*0.1*	*0.11*	*15462*			
	4262947	***Total***			**1404874.2**	**0.60**	***70243.7***	***70500***

Notes:

Extended Detention Basin Design Procedure	BMP Subarea No. DMA A	Legend:	Required Entries / Calculated Cells

Company Name: Hunsaker & Associates — Date: Nov 2021

Designed by: Brian Lowell — County/City Case No.:

Design Volume

Tributary Area (BMP Subarea) — A_T = 97.8638 acres

Enter $V_{BMP,}$ determined from Section 2.1 of this Handbook — V_{BMP}= 70,244 ft^3

Basin Footprint

Overall Geometry

Length at Basin Bottom Surface — Length = 240 ft

Width at Basin Bottom Surface — Width = 160 ft

Meets 1.5 : 1 requirement? ✓

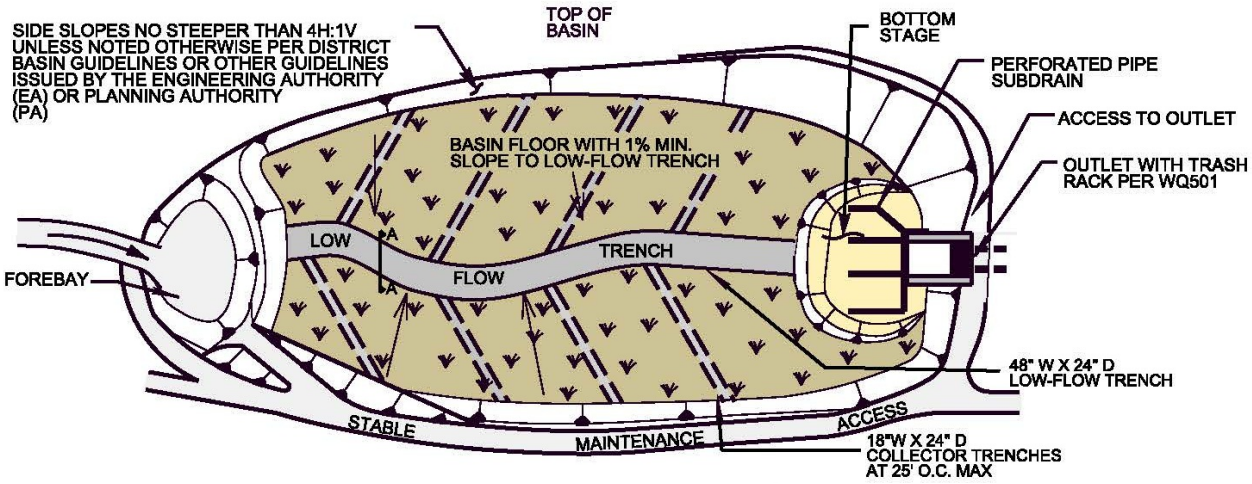
Side Slopes per "Basin Guidelines", Sect. 1.2 — z = 4 :1

Proposed Basin Depth (with no freeboard) — D_B = 6.00 ft

Depth of freeboard (if used) — D_{FB} = 2.00 ft

Minimum Required Allowance for Total Depth (including proposed basin depth, freeboard, minimum depth of bottom stage (D_{BS}=0.33') and minimum filter depth (D_{FD}=2.33')) — D_{REQ} = 10.7 ft

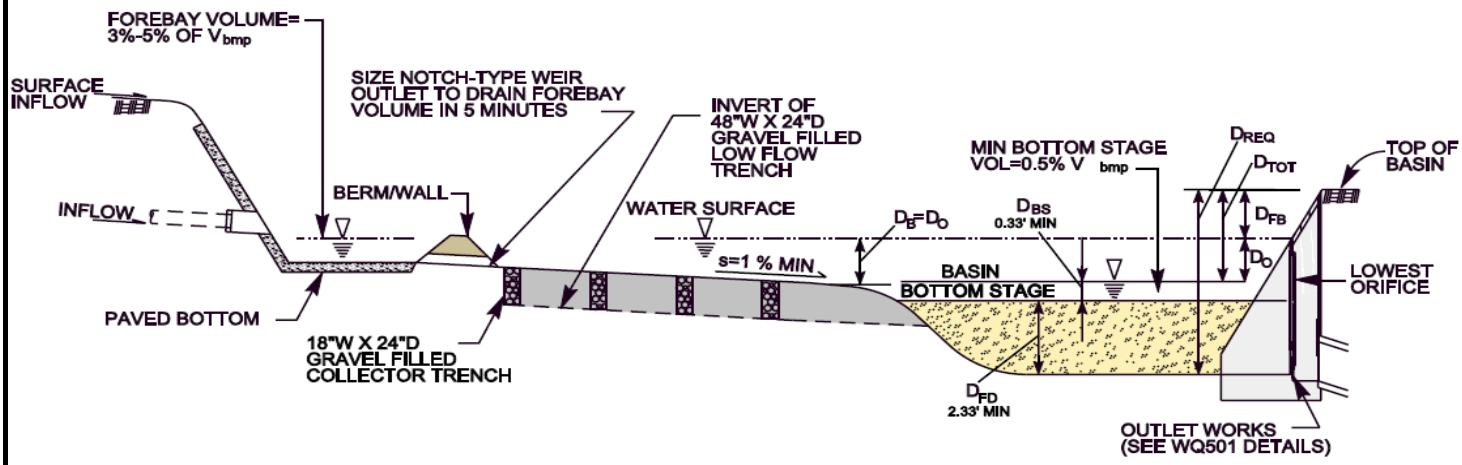
Depth from design water surface elevation to lowest orifice — D_O = 6.0 ft



Basin Design

Basin Design

Proposed Total Basin Depth (proposed depth plus freeboard)	D_{TOT} =	8.00	ft
Basin Invert Longitudinal Slope	Slope =	1.00	%
Basin Invert Transverse Slope (1% min)	Slope =	1	%
Basin Volume	V_{Basin} =	100116	ft^3



Forebay Design

Forebay Volume (3 - 5% V_{BMP})	V_{FB} =	3326	ft^3
Forebay Depth (height of berm)	D_{FBY} =	1.5	ft
Minimum Forebay Surface Area	A_{FB} =	2217	ft^2
Rectangular weir (notch)	W =	4.00	in

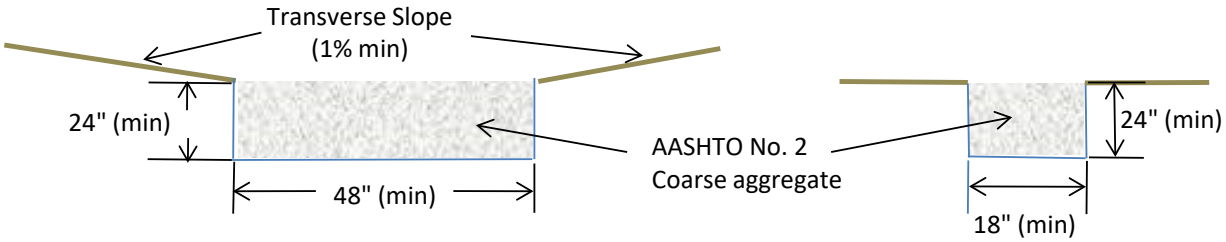
Dry Weather and Low-Flow Management

Low-Flow Trench (see graphic below)

Depth (24 inches minimum, gravel filled)	Depth =	24	inches
Width (48 inches minimum)	Width =	48	inches
Trench Invert Longitudinal Slope	Slope =	1	%

Collector Trenches (see graphic below)

Depth (24 inches minimum)	Depth =	24	inches
Width (18 inches minimum)	Width =	18	inches
Trench Invert Longitudinal Slope	Slope =	1	%
Spacing (25 feet on center maximum)	S =	25	feet



Low-Flow Trench **Collector Trench**

Bottom Stage (Sand Filter) Design

Depth of the Bottom Stage (4" minimum ponding)	D_{BS} =	4	in
Surface Area of Bottom Stage	A_{BS} =	630	ft^2
Dry Weather Ponded Volume (above sand layer)	V_{BS} =	210	ft^3

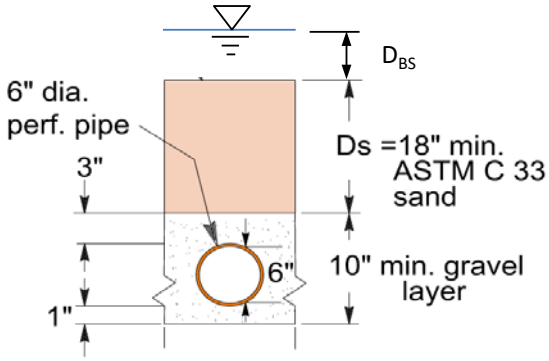
Is V_{BS} no less than 0.5% V_{BMP}? OK

Depth of ASTM-C33 sand (18 inch minimum)

Ds = 18 inches

Diameter of Subdrains: ϕ = 6 in

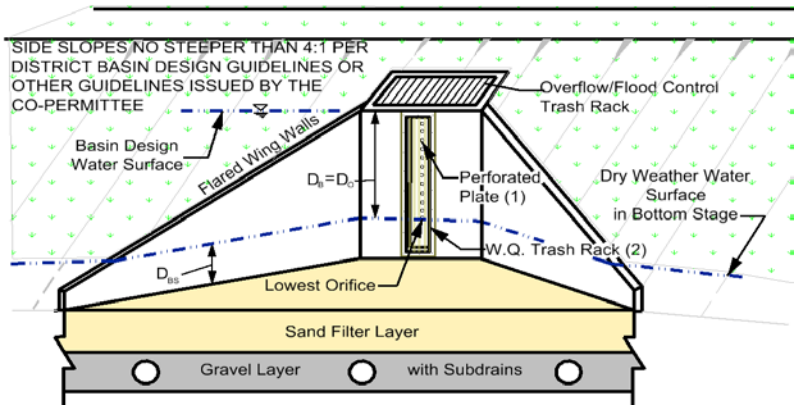
Subdrain Spacing: s = 10 ft. on center



Basin Outlet Design

Outlet Design

Assume an orifice area. Based on the information provided above, the spreadsheet provides discharge vs. stage data. Enter the volume vs. stage data for each interval. This information is used to route the volume through the basin. The size of the orifice is acceptable when the data shows that less than 50% of V_{BMP} has drained in 24 hours, and that 100% drawdown occurs within 72 hours.



Flow Rate, Q (cfs)

$$Q=CA[2g(H-H_o)]^{0.5}$$

Discharge Coefficient,

Default, C = 0.66

Other, C = 0.66

Orifice Area (ft^2)

Orifice Diameter, d; number of orifices per row, n; and number of orifice rows, N (from the bottom up).

d = 1.9 inches

n = 2 per row

N = 1 rows

Aeff = 0.039 ft^2 per row

or

Aeff = 5.668 in^2 per row

From outflow hydrograph, the time where 50% of V_{BMP} has drained from the basin (24 hour minimum):

Time (50%) = 25.75 hrs

OK

From outflow hydrograph, the time where 100% V_{BMP} has drained from the basin(within 72 hours):

Time (100 %) = 56.09 hrs

OK

Headwater Elev. / Stage (ft)	Discharge (cfs)	Volume (acre-ft)	Δt (hrs.)
0	0.0000	0.0000	
0.33	0.1203	0.004	0.74
0.67	0.1703	0.018	1.20
1.00	0.2085	0.026	0.50
1.33	0.2407	0.047	1.15
1.67	0.2692	0.078	1.47
2.00	0.2948	0.148	3.00
2.33	0.3184	0.210	2.43
2.67	0.3404	0.292	3.04
3.00	0.3611	0.459	5.75
3.33	0.3806	0.639	5.87
3.67	0.3992	0.819	5.59
4.00	0.4169	0.999	5.34
4.33	0.4339	1.243	6.92
4.67	0.4503	1.486	6.66
5.00	0.4661	1.730	6.43
5.33	*0.4814*	*2.024*	
5.67	*0.4963*	*2.319*	
6.00	*0.5106*	*2.614*	
6.33			
6.67			
7.00			
7.33			
7.67			
8.00			
8.33			
8.67			
9.00			
9.33			
9.67			
10.00			
		∑ =	56.09

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries; Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Hunsaker & Associates — Date: Nov 2021

Designed by: Brian Lowell — Case No:

Company Project Number/Name: Golden Meadows - Phase 4

BMP Identification

BMP NAME / ID: DMA 'C'

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.60 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V_{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
C-1 Roof	100,000	Roofs	1	0.89	89200			
C-2 Driveways	16,000	Concrete or Asphalt	1	0.89	14272			
C-3 Pavement	53,588	Concrete or Asphalt	1	0.89	47800.5			
C-4 Sidewalk	16,156	Concrete or Asphalt	1	0.89	14411.2			
C-5 Parkway	10,601	Ornamental Landscaping	0.1	0.11	1171			
C-6 Slopes	69,626	Ornamental Landscaping	0.1	0.11	7690.7			
C-7 Res	131,267	Ornamental Landscaping	0.1	0.11	14499.5			
C-8 Basin	15,559	Natural (A Soil)	0.03	0.06	973.1			
C-9 DG Road	6,452	Decomposed Granite	0.4	0.28	1804.7			
C-10 Natural	198,182	Natural (A Soil)	0.03	0.06	12394.5			
	617431	Total			204217.2	0.60	10210.9	13000

Notes:

Extended Detention Basin Design Procedure	BMP Subarea No. DMA C	Legend:	Required Entries / Calculated Cells

Company Name: Hunsaker & Associates — Date: Nov 2021

Designed by: Brian Lowell — County/City Case No.:

Design Volume

Tributary Area (BMP Subarea) — A_T = 14.17427 acres

Enter $V_{BMP,}$ determined from Section 2.1 of this Handbook — V_{BMP}= 10,211 ft^3

Basin Footprint

Overall Geometry

Length at Basin Bottom Surface — Length = 206 ft

Width at Basin Bottom Surface — Width = 77 ft

Meets 1.5 : 1 requirement? ✓

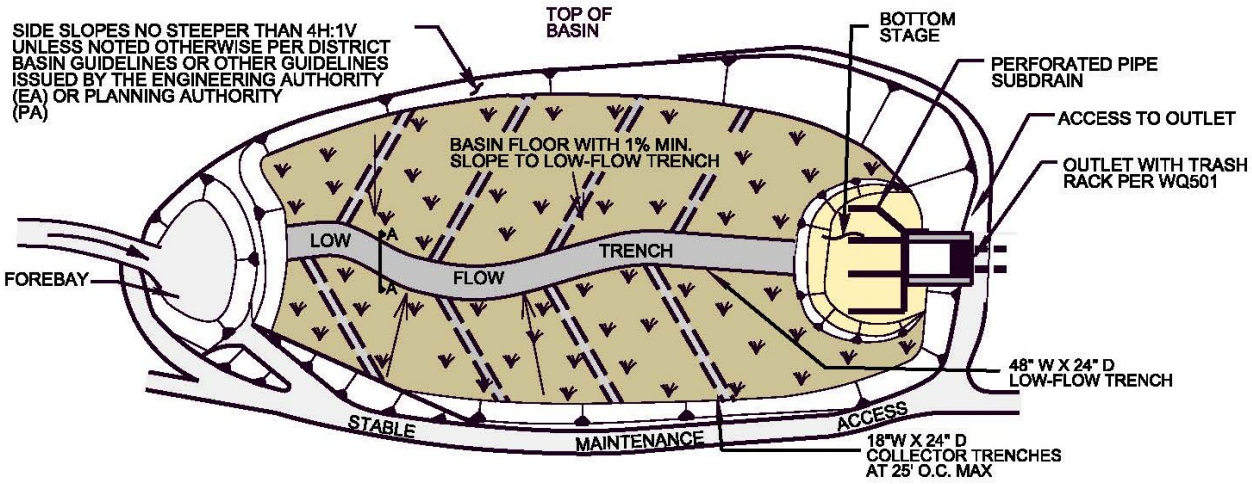
Side Slopes per "Basin Guidelines", Sect. 1.2 — z = 4 :1

Proposed Basin Depth (with no freeboard) — D_B = 6.00 ft

Depth of freeboard (if used) — D_{FB} = 2.00 ft

Minimum Required Allowance for Total Depth (including proposed basin depth, freeboard, minimum depth of bottom stage (D_{BS}=0.33') and minimum filter depth (D_{FD}=2.33')) — D_{REQ} = 10.7 ft

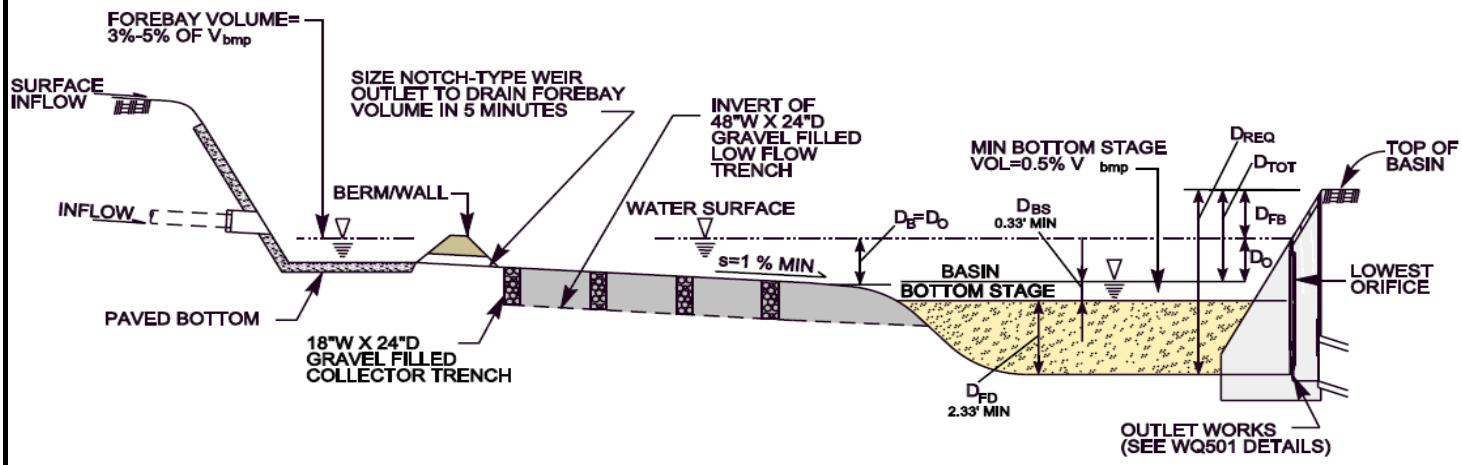
Depth from design water surface elevation to lowest orifice — D_O = 6.0 ft



Basin Design

Basin Design

Proposed Total Basin Depth (proposed depth plus freeboard)	D_{TOT} =	8.00	ft
Basin Invert Longitudinal Slope	Slope =	1.00	%
Basin Invert Transverse Slope (1% min)	Slope =	1	%
Basin Volume	V_{Basin} =	42547	ft^3



Forebay Design

Forebay Volume (3 - 5% V_{BMP})	V_{FB} =	510.55	ft^3
Forebay Depth (height of berm)	D_{FBY} =	1.5	ft
Minimum Forebay Surface Area	A_{FB} =	340	ft^2
Rectangular weir (notch)	W =	4.00	in

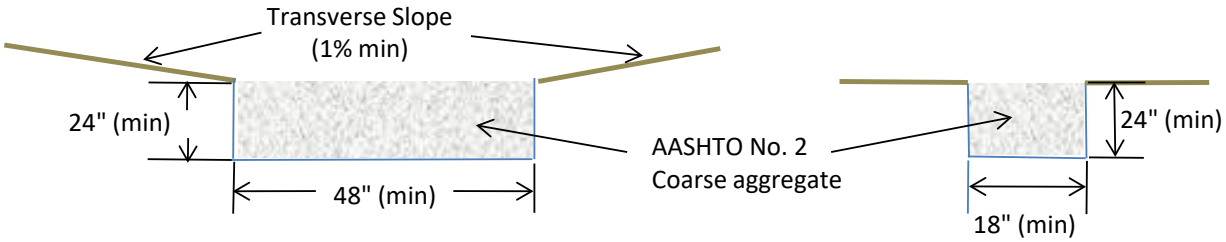
Dry Weather and Low-Flow Management

Low-Flow Trench (see graphic below)

Depth (24 inches minimum, gravel filled)	Depth =	24	inches
Width (48 inches minimum)	Width =	48	inches
Trench Invert Longitudinal Slope	Slope =	1	%

Collector Trenches (see graphic below)

Depth (24 inches minimum)	Depth =	24	inches
Width (18 inches minimum)	Width =	18	inches
Trench Invert Longitudinal Slope	Slope =	1	%
Spacing (25 feet on center maximum)	S =	25	feet



Low-Flow Trench **Collector Trench**

Bottom Stage (Sand Filter) Design

Depth of the Bottom Stage (4" minimum ponding)	D_{BS} =	4	in
Surface Area of Bottom Stage	A_{BS} =	630	ft^2
Dry Weather Ponded Volume (above sand layer)	V_{BS} =	210	ft^3

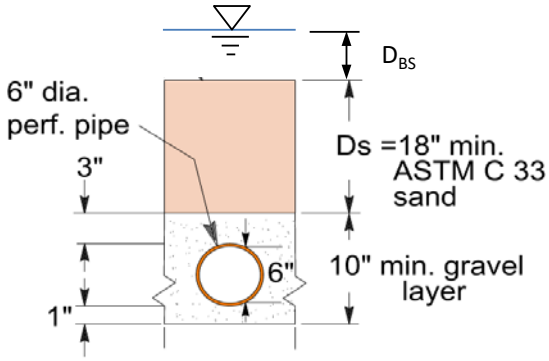
Is V_{BS} no less than 0.5% V_{BMP}? OK

Depth of ASTM-C33 sand (18 inch minimum)

Ds = 18 inches

Diameter of Subdrains: ϕ = 6 in

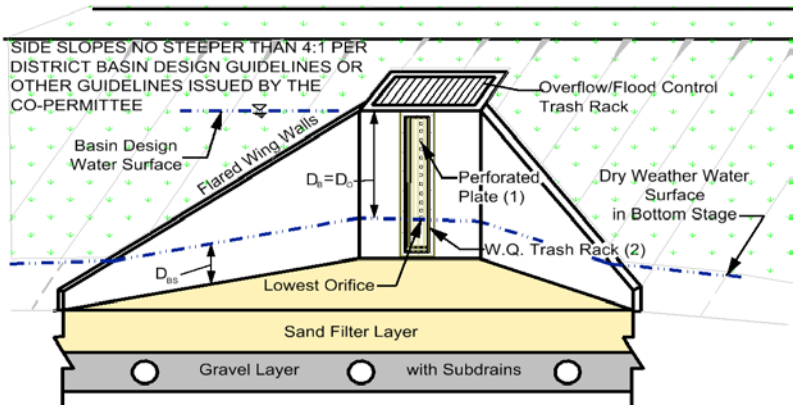
Subdrain Spacing: s = 10 ft. on center



Basin Outlet Design

Outlet Design

Assume an orifice area. Based on the information provided above, the spreadsheet provides discharge vs. stage data. Enter the volume vs. stage data for each interval. This information is used to route the volume through the basin. The size of the orifice is acceptable when the data shows that less than 50% of V_{BMP} has drained in 24 hours, and that 100% drawdown occurs within 72 hours.



Flow Rate, Q (cfs)

$$Q=CA[2g(H-H_o)]^{0.5}$$

Discharge Coefficient,

Default, C = 0.66

Other, C = 0.66

Orifice Area (ft^2)

Orifice Diameter, d; number of orifices per row, n; and number of orifice rows, N (from the bottom up).

d = 1.2 inches

n = 1 per row

N = 1 rows

Aeff = 0.008 ft^2 per row

or

Aeff = 1.130 in^2 per row

From outflow hydrograph, the time where 50% of V_{BMP} has drained from the basin (24 hour minimum):

Time (50%) = 24.24 hrs

OK

From outflow hydrograph, the time where 100% V_{BMP} has drained from the basin(within 72 hours):

Time (100 %) = 55.38 hrs

OK

Headwater Elev. / Stage (ft)	Discharge (cfs)	Volume (acre-ft)	Δt (hrs.)
0	0.0000	0.0000	
0.33	0.0240	0.004	3.63
0.67	0.0340	0.007	1.50
1.00	0.0416	0.011	1.15
1.33	0.0480	0.040	7.92
1.67	0.0537	0.069	6.97
2.00	0.0588	0.099	6.30
2.33	0.0635	0.149	9.95
2.67	0.0679	0.199	9.24
3.00	0.0720	0.250	8.70
3.33	*0.0759*	*0.326*	
3.67	*0.0796*	*0.402*	
4.00	*0.0832*	*0.478*	
4.33	*0.0865*	*0.583*	
4.67	*0.0898*	*0.689*	
5.00	*0.0930*	*0.795*	
5.33	*0.0960*	*0.855*	
5.67	*0.0990*	*0.916*	
6.00	*0.1018*	*0.977*	
6.33			
6.67			
7.00			
7.33			
7.67			
8.00			
8.33			
8.67			
9.00			
9.33			
9.67			
10.00			
		∑ =	55.38

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Hunsaker & Associates — Date: Nov 2021

Designed by: Brian Lowell — Case No:

Company Project Number/Name: Golden Meadows - Phase 4

BMP Identification

BMP NAME / ID: DMA 'D'

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.60 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V_{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
D-1 Roof	378,000	Roofs	1	0.89	337176			
D-2 Driveways	60,480	Concrete or Asphalt	1	0.89	53948.2			
D-3 Pavement	395,799	Concrete or Asphalt	1	0.89	353052.7			
D-4 Sidewalk	112,435	Concrete or Asphalt	1	0.89	100292			
D-5 Parkway	83,596	Ornamental Landscaping	0.1	0.11	9233.8			
D-6 Slopes	137,022	Ornamental Landscaping	0.1	0.11	15135.2			
D-7 Turf	1,098,384	Ornamental Landscaping	0.1	0.11	121325.3			
D-8 Open Space	107,591	Ornamental Landscaping	0.1	0.11	11884.3			
D-9 Basin Bottom	56,338	Natural (A Soil)	0.03	0.06	3523.4			
D-10 DG Access Road	2,670	Decomposed Granite	0.4	0.28	746.8			
	2432315	Total			1006317.7	0.60	50315.9	51000

Notes:

Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID DMA 'D'	Legend:	Required Entries / Calculated Cells

Company Name: Hunsaker & Associates — Date: Nov 2021

Designed by: Casey Erickson — County/City Case No.:

Design Volume

a) Tributary area (BMP subarea)	A_T =		acres
b) Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	50,316	ft^3

Maximum Depth

a) Infiltration rate	I =	0.67	in/hr
b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook)	FS =	3	
c) Calculate D_1 $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$	D_1 =	1.3	ft
d) Enter the depth of freeboard (at least 1 ft)		1	ft
e) Enter depth to historic high ground water (measured from **top** of basin)		100	ft
f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin)		20	ft
g) D_2 is the smaller of: Depth to groundwater - (10 ft + freeboard) and Depth to impermeable layer - (5 ft + freeboard)	D_2 =	14.0	ft
h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet	D_{MAX} =	1.3	ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1)	z =	4	:1
b) Proposed basin depth (excluding freeboard)	d_B =	1.3	ft
c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$)	A_S =	38705	ft^2
d) Proposed Design Surface Area	A_D =	56338	ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP})	Volume =	252	ft^3
b) Forebay depth (height of berm/splashwall. 1 foot min.)	Depth =	1.5	ft
c) Forebay surface area (minimum)	Area =	168	ft^2
d) Full height notch-type weir	Width (W) =	4.0	in

Notes:

3.6 Extended Detention Basin

Type of BMP	LID - Biotreatment
Treatment Mechanisms	Sedimentation, Infiltration, Biofiltration, Evapotranspiration, and Evaporation
Minimum Tributary Drainage Area	5 acres
Other Names	Enhanced Water Quality Basin

Overview

The Extended Detention Basin (EDB) is designed to detain the design volume of stormwater, V_{BMP}, and maximize opportunities for volume losses through infiltration, evaporation, evapotranspiration and surface wetting. Additional pollutant removal is provided through sedimentation, in which pollutants can attach to sediment accumulated in the basin through the process of settling. Stormwater enters the EDB through a *forebay* where any trash, debris, and sediment accumulate for easy removal. Flows from the forebay enter the basin which is vegetated with native grasses that enhance infiltration and evapotranspiration, and which is interspersed with gravel-filled trenches that help further enhance infiltration. Water that does not get infiltrated or evapotranspired is conveyed to the *bottom stage* of the basin. At the bottom stage of the basin, low or incidental dry weather flows will be treated through a sand filter and collected in a subdrain structure. Any additional flows will be detained in the basin for an extended period by incorporating an outlet structure that is more restrictive than a traditional detention basin outlet. The restrictive outlet structure extends the drawdown time of the basin which further allows particles and associated pollutants to settle out before exiting the basin, while maximizing opportunities for additional incidental volume losses.

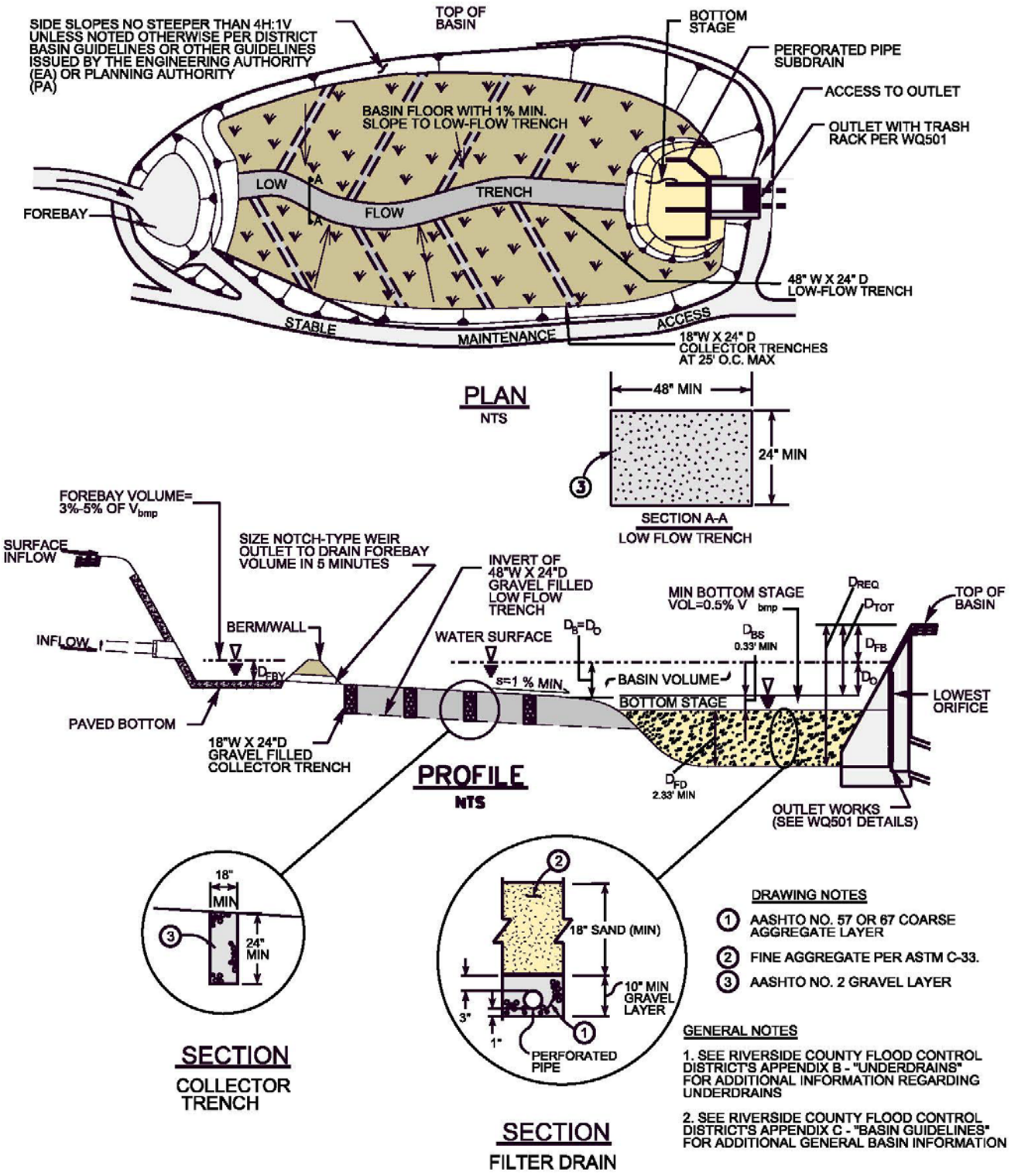


Figure 1 – Extended Detention Basin

Siting Considerations

Soils: EDBs can be used with almost all soils and geology. However, pollutant removal effectiveness is greatly improved when the underlying soil permits at least some infiltration.

Tributary Area: EDBs should only be used where the tributary drainage area is at least 5 acres, since meeting the draw-down requirements (discussed below) for smaller areas would result in very small outlet orifice diameters which would be prone to clogging.

Proximity to Receiving Waters: All site runoff must be treated to the MEP with appropriate BMPs *before* being discharged into Receiving Waters; as such the EDB cannot be constructed in-line within Receiving Waters.

Setbacks: Due to the infiltration characteristics incorporated into the EDB design, the lowest pervious point (beneath the filter drain) of the extended detention facility should be a minimum of 10' above the seasonal high groundwater table. All other setbacks shall be in accordance with applicable standards of the "Basin Guidelines" (Appendix C) or other guidelines issued by the Engineering Authority (EA).

Basin Guidelines: See Section 1 of the "Basin Guidelines" (Appendix C) for additional requirements (i.e., fencing, maintenance access, etc.) that may be required by the Engineering Authority (EA).

Landscaping Requirements

Basin vegetation provides erosion protection, enhances evapotranspiration and infiltration, and improves pollutant removal. The upper stage basin surface, berms and side slopes shall be planted with native grasses. Proper landscape management is also required to ensure that the vegetation does not contribute to water pollution through the use of pesticides, herbicides, or fertilizers. Landscaping shall be in accordance with applicable standards of the "Basin Guidelines" (Appendix C) or other guidelines issued by the EA.

Maintenance Guidelines

Schedule	Inspection and Maintenance Activity
During every scheduled maintenance check (per below), and *as needed* at other times	• Maintain vegetation as needed. Use of fertilizers, pesticides and herbicides should be strongly avoided to ensure they don't contribute to water pollution. If appropriate native plant selections and other IPM methods are used, such products shouldn't be needed. If such projects are used: o Care should be taken to avoid contact with the low-flow or other trenches, and the media filter in the bottom stage. o Products shall be applied in accordance with their labeling, especially in relation to application to water, and in areas subjected to flooding. o Fertilizers should not be applied within 15 days before, after, or during the rainy season. • No ponded water should be present for more than 72 hours to avoid nuisance or vector problems. No algae formation should be visible. Correct problems as needed.
Annually. If possible, schedule these inspections before the beginning of the rain season to allow for any repairs to occur before rains occur.	• Remove debris and litter from the entire basin • Inspect hydraulic and structural facilities. Examine the outlet for clogging, the embankment and spillway integrity, as well as damage to any structural element. • Check for erosion, slumping and overgrowth. Repair as needed. • Inspect sand media at the filter drain to verify it is allowing acceptable infiltration. **Scarify top 3 inches by raking the filter drain's sand surface annually.** • Check the media filter underdrains (via the cleanout) for damage or clogging. Repair as needed. • Remove accumulated sediment and debris from the forebay, and ensure that the notch weir is clear and will allow proper drainage. • Check gravel filled low flow and collector trenches for sediment buildup and repair as needed.
Every 5 years or sooner (depending on whether observed drain times to empty the basin are less than 72 hours).	• Remove the top 3 inches of sand from the filter drain and backfill with 3 inches of new sand to return the sand layer to its original depth. When scarification or removal of the top 3 inches of sand is no longer effective, remove and replace sand filter layer.
Whenever substantial sediment accumulation has occurred.	• Remove accumulated sediment from the bottom of the basin. Removal should extend to original basin depth.

EXTENDED DETENTION BASIN BMP FACT SHEET

Design Summary

Design Parameter	Extended Detention Basin
Drawdown time (total)	72 hours [2,3]
Minimum drawdown time for 50% V_{BMP}	24 hours [2]
Minimum tributary area	5 acres [2]
Outlet erosion control	Energy dissipaters to reduce velocities[1]
Forebay volume	3 to 5 % of V_{BMP} [3]
Basin Invert Longitudinal Slope (min.)	1%
Basin Invert Transverse (cross) Slope (min)	1%
Low-flow trench width (min.)	48 inches
Low-flow trench depth (min.)	24 inches
Slope of low-flow trench along bottom excavated Surface (max.)	1%
Slope of gravel collector trenches along bottom excavated surface (max.)	1 %
Length to width ratio (min.)	1.5:1
Basin depth (min.)	1 foot [3]
Bottom stage volume	0.5 % of V_{BMP} [3]
Bottom stage depth (min)	0.33 feet [3]
Filter drain depth (min)	2.33 feet [3]

1. **Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures**
2. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**
3. **Denver, Colorado's UDFCD Drainage Criteria Manual, Volume 3**

Note: The information contained in this BMP Factsheet is intended to be a summary of design considerations and requirements. Additional information which applies to all detention basins may be found in the "Basin Guidelines" (Appendix C). In addition, information herein may be superseded by other guidelines issued by the Engineering Authority.

Design Procedure

These steps correspond to and provide a description of the information required in the EDB Design Worksheet.

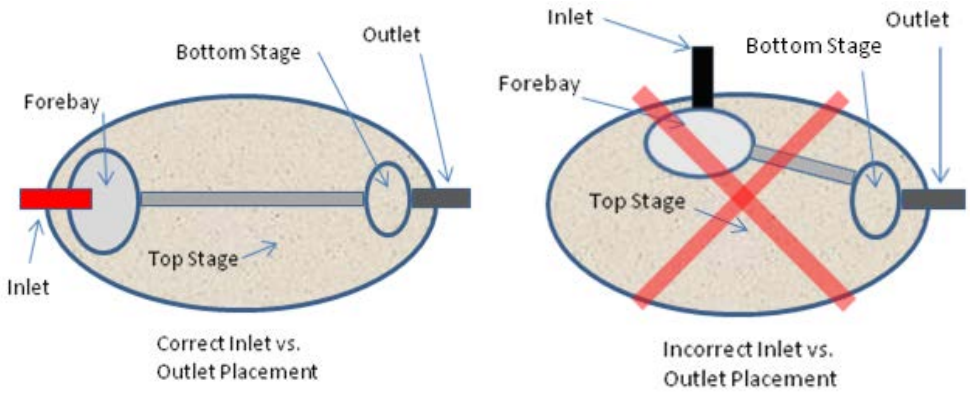
1. Find the Design Volume, V_{BMP}.

a) Enter the tributary area, A_T to the BMP. The minimum tributary area is 5 acres.

b) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.

2. Basin Footprint

a) Enter the length and width of the EDB. The length shall be measured between the inlet to the basin and the outlet structure; and the width shall be measured at the widest point of the basin invert. The length to width ratio should be 1.5:1 or longer to prevent short-circuiting and increase the overall effectiveness of the BMP.



b) Enter the internal basin side slopes. See the "Basin Guidelines" (Appendix C) for side slope requirements. If variable internal side-slopes are used, enter the steepest slope that will be used.

c) Using Figure 1 as a guide, enter the proposed basin depth, D_B, and the freeboard depth, D_{FB}. Based on the information provided, the spreadsheet will calculate the minimum total depth required, D_{REQ}, for this BMP. D_{REQ} is the depth from the bottom of the underdrain layer in the bottom stage (see step 5c), to the top of the freeboard. This calculated minimum required depth can be used to determine if enough elevation difference is available within the design topography to allow for use of this BMP.

d) Additionally, the basin depth D_B is equal to $D_{O,}$ which is the depth from the design pond water surface elevation to the lowest orifice in the outlet structure. D_O is confirmed by the spreadsheet and is used in the Basin Outlet Design described in step 6 below. It should be noted that this lowest orifice is a critical elevation in the design of this BMP. The Volume of the Basin V_{Basin} described in step 3d) is the volume of water above this lowest orifice. This lowest-orifice also represents the dry weather ponded water surface discussed in step 5c below. Below this elevation there must be a minimum of a 4-inch drop down to the surface of the Sand Filter in the bottom stage.

3. Basin Design

a) The Total Basin Depth, D_{TOT}, is calculated automatically, and is the sum of the basin depth D_B plus the freeboard depth D_{FB}.

b) Enter the longitudinal slope of the basin invert. This slope must be at least 1% and is measured along the low flow trench between the forebay and the bottom stage. Note that the surface of the sand layer in the bottom stage must be level (see Figure 1).

c) Enter the transverse slope of the basin invert. This transverse (cross sectional) slope must be at least 1% sloped toward the low flow trench.

d) Enter the Volume of the Basin, V_{Basin}. This volume must be the actual volume of water held within the basin as substantiated by modeling or appropriate volumetric calculations, and must be equal to or greater than V_{BMP}. This volume must be held above the lowest orifice in the Basin Outlet Design described in step 6 below.

4. Forebay Design

All flows must enter the basin through the forebay. The forebay provides a location for the settlement and collection of larger particles, and any other trash or debris. A relatively smooth and level concrete bottom surface should be provided to facilitate mechanical removal of any accumulated sediment, trash and debris.

Figure 2: Forebay filled with storm water

a) Enter the Forebay Volume VFB. This volume must be from 3 to 5 percent of V_{BMP}.

b) A rock or concrete berm must be constructed to detain water before it drains into the basin. The top of the berm shall be set no higher than the invert of the inlet conveyance. Enter the Forebay Depth, D_{FBY}.

c) The spreadsheet will calculate the minimum surface area of the forebay, A_{FB}, based on the provided Forebay Volume and Depth. Ensure that the plans provide for a forbay area at least this large.

d) Although the forebay will be well submerged in the design event, a full height rectangular notch-type weir shall be constructed through the berm to prevent permanent ponding in the forebay, and allow water to slowly and fully drain to the main body of the basin. This notch should be offset from the inflow streamline to prevent low-flows from short circuiting. Enter the width, W, of this rectangular notch weir. The width shall not be less than 1.5 inches to prevent clogging. Additionally,

immediately outside the notch construct a minimum 1-foot by 1-foot gravel pad to prevent vegetative growth within the basin invert from blocking the notch.

5. Dry Weather and Low-Flow Management

The basin shall have both a low-flow gravel trench and a network of gravel collector trenches across the invert of the basin, as well as a bottom stage sand filter to treat low flows and dry weather flows (see Figure 1).

a) Low Flow Trench: The low-flow gravel trench conveys flow from the forebay to the bottom stage, while allowing for maximum incidental infiltration and volume loss. The trench shall be a minimum of 48 inches wide by 24 inches deep. This trench shall be unlined and backfilled with AASHTO No. 2 gravel (or similar) to the finished surface of the basin invert, and shall not use underdrains. The bottom excavated surface of the low-flow trench shall be 1 percent or flatter to promote infiltration.

Figure 3: Gravel filled low-flow trench

b) Collector Trenches: Gravel collector trenches beneath the top stage shall be arranged as illustrated in Figure 1 of Appendix C with minimal slope (1% maximum) along their bottom excavated surface to promote infiltration, and must extend from the low-flow trench to the toe of the basin side slopes. They shall be a minimum of 18-inches wide by 24-inches deep, unlined and backfilled with AASHTO No. 2 gravel (or similar) to the finished basin invert surface. The gravel collector trenches shall not use underdrains and shall be constructed with a maximum spacing of 25 feet, center to center. See Figure 1 of Appendix C.

c) Bottom Stage: A depressed sand filter drain area, referred to as the bottom stage, must be constructed adjacent to the outlet structure to treat any dry weather flows. To ensure that dry weather flows are treated through the sand filter and not discharged through the orifice plate, the top surface of the sand filter must be depressed at least 4 inches below the lowest orifice in the outlet structure. This depressed area will create a micro pool of water that is then filtered down through the sand filter and out through underdrains. Based on the minimum dimensions described below, the minimum depth of excavation below the lowest orifice in the outlet structure is 2.33 feet.

   i. Enter the Depth of the bottom stage, D_{BS}. As mentioned above, this depth must be at least 4 inches, and extend down below the lowest orifice in the outlet structure.

   ii. Enter the area of the bottom stage, A_{BS}.

iii. Based on the D_{BS} and A_{BS} entered, the spreadsheet will calculate V_{BS}. This volume is the volume of ponded water that will be held below the lowest orifice in the outlet structure, and above the surface of the sand filter. This volume must be at least 0.5% of V_{BMP}.

iv. Enter the thickness of the ASTM C-33 sand layer that will be provided, D_S. A minimum thickness of 18 inches is required.

v. Below the sand layer, a minimum 10-inch thick layer of gravel shall be installed with underdrains to drain the water that has been treated through the sand filter. The underdrains shall connect into the outlet structure. See Appendix B for standard underdrain construction. Enter the diameter of the underdrain pipe (minimum 6" dia.), and the spacing of the underdrains. The maximum spacing of the underdrains is 20 feet on center, however where the area of the bottom stage is particularly small (less than 500 square feet), the underdrain pipes shall be placed at no more than a 10-foot separation on center.

6. Basin Outlet Design

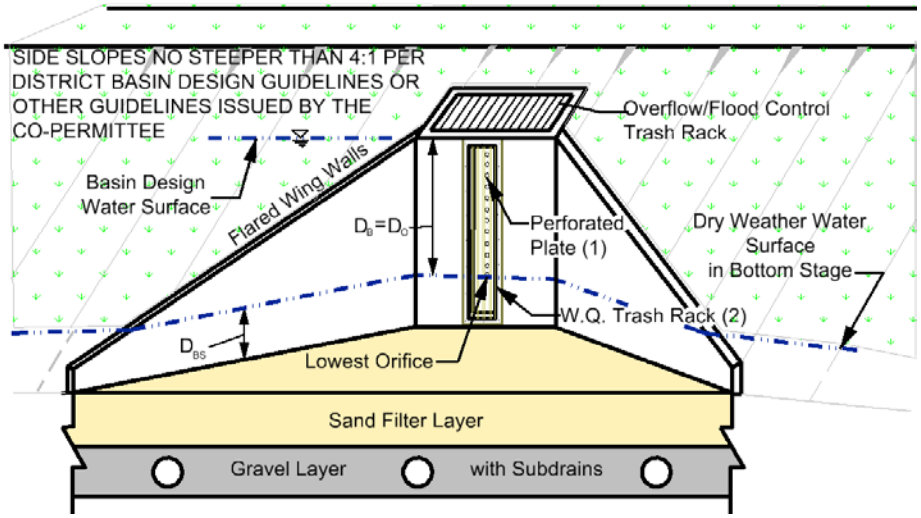


Figure 4: Basin Outlet Structure with Bottom Stage Shown

Outlet structures for publicly maintained basins shall conform to District Standard Drawings WQ501 unless approved in advance by the local Engineering Authority (EA). This standardization is to provide for efficient maintenance. The basin outlet should be sized to release the design volume, VBMP, within a 72-hour period but 50 percent of VBMP within 24 hours. This is an iterative design process where an appropriate control orifice can be selected using the following steps:

a. Develop a Stage vs. Discharge Curve for the Outlet Structure

Estimate the orifice size and outlet plate configuration (number per row, etc.). Based on D_O provided in the Basin Footprint section, the spreadsheet will automatically generate the stage vs. discharge relationship for this outlet:

$$Q = C*A*[2*g*(H-H_o)]^{0.5}$$

Where:

Q = discharge (ft^3/s)

C = orifice coefficient

A = area of the orifice (ft)

g = gravitational constant (32.2 ft2/s)

H = water surface elevation (ft)

H_o = orifice elevation (ft)

The lowest orifice shall be located with its centerline at the top of the bottom stage; at least 4 inches above the surface of the sand filter drain. To help avoid clogging, the minimum orifice diameter is limited to 3/8 inch. Since the 1/4 inch thickness of the orifice plate will be less than the orifice diameter, a value for C of 0.66 may be used. If another value for C is used, justification may be required.

b. Develop a Discharge/Volume vs. Stage Table for the Basin

Based on the shape and size of the basin, develop a relationship between the stage and the volume of water in the basin. Since the orifice spacing is 4 inches on center for the standard orifice plate, the stage intervals must also be 4 inches. Enter the basin volume at each interval starting at the centerline of the lowest orifice.

c. Route the Design Volume through the Basin

The spreadsheet assumes that the Design Volume, $V_{BMP,}$ enters the basin instantaneously and as such, no inflow/outflow hydrograph is necessary. The drawdown time for each stage becomes:

$$\Delta t = V_i/Q$$

Where:

Δt = drawdown time for each stage

V_i = the volume at each stage

Q = the flow rate corresponding to the headwater elevation at each stage.

The spreadsheet automatically determines the drawdown time from the sum of the Δt values for each stage. If the orifice size and plate configuration estimate meets the

hydraulic retention time requirements (50% of the volume empties in not less than 24 hours, 100% of the volume empties in no more than 72 hours), the outlet is correctly sized. If these requirements are not met, select a new orifice size or configuration and repeat the process starting at Step 6a.

7. Outlet Protection

To prevent the orifices from clogging, trash racks are required where perforated vertical outlet control plates are used. This allows for easier access to outlet orifices for inspection and cleaning. Trash racks shall be sized to prevent clogging of the primary water quality outlet without restricting the hydraulic capacity of the outlet control orifices. The orifice plate shall be protected with a trash rack conforming to Standard Drawing WQ501 (at end of this section) with at least six square feet of open surface area or 25 times the total orifice area, whichever is greater. The rack shall be adequately secured to prevent it from being removed or opened when maintenance is not occurring.

Overflow Structure Similar to Standard Drawing Number WQ 501
(Photo courtesy of Colorado Association of Stormwater Floodplain Managers)

Trash rack with screen

8. Overflow Outlet

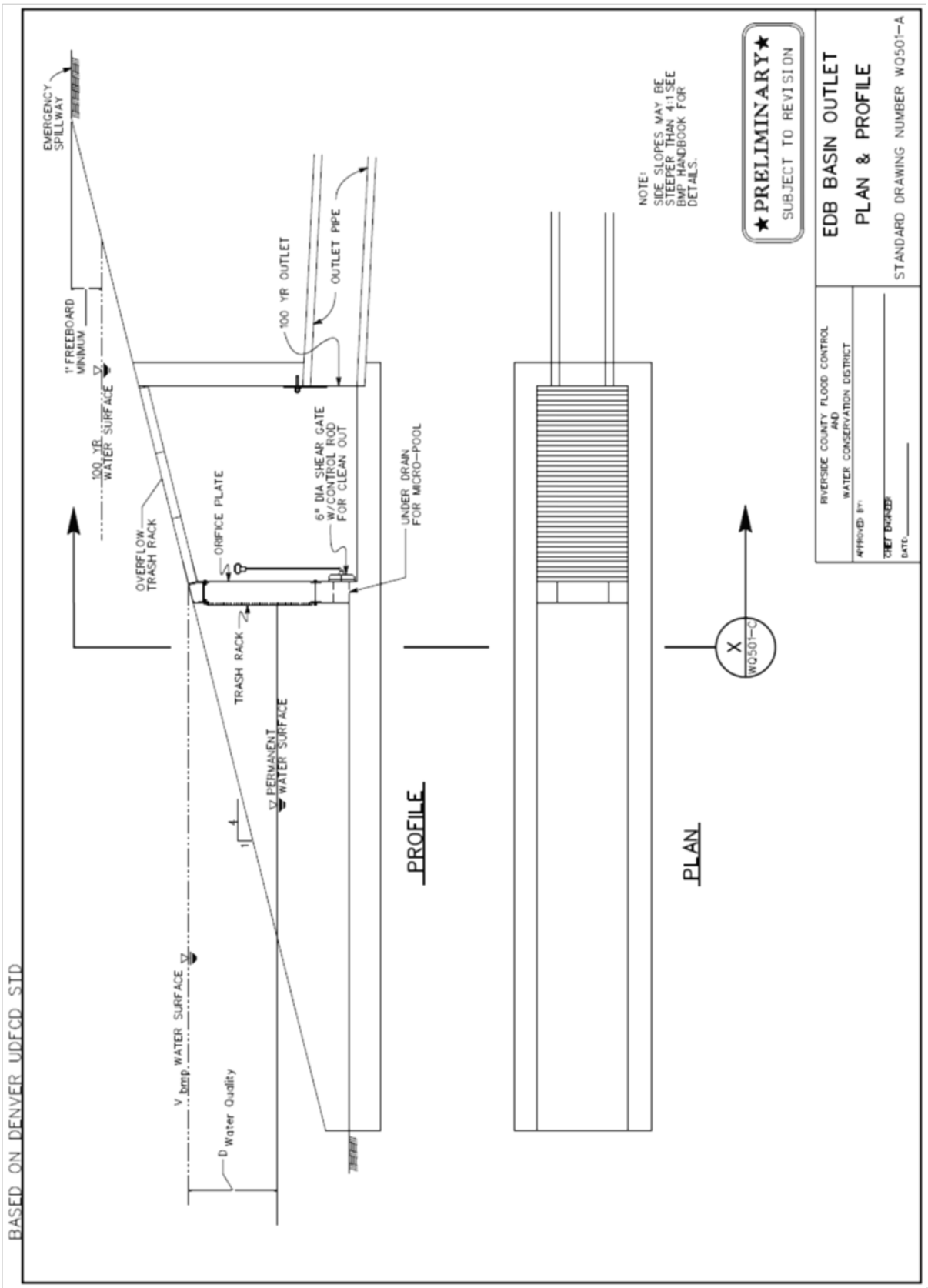
Overflow outlets for publicly maintained basins shall conform to Standard Drawing WQ501 (at end of this section) unless approved in advance by the Engineering Authority (EA).

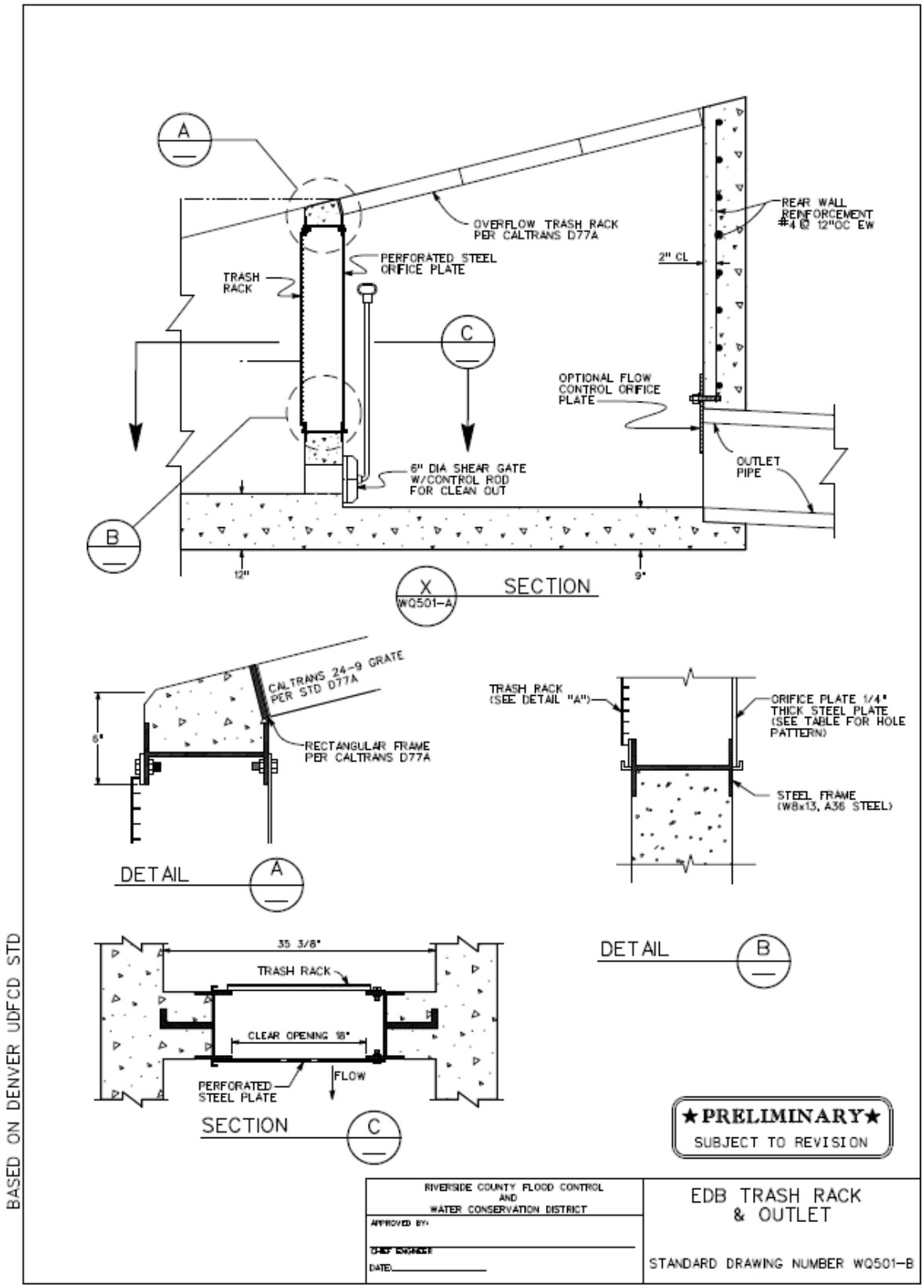
9. Embankment

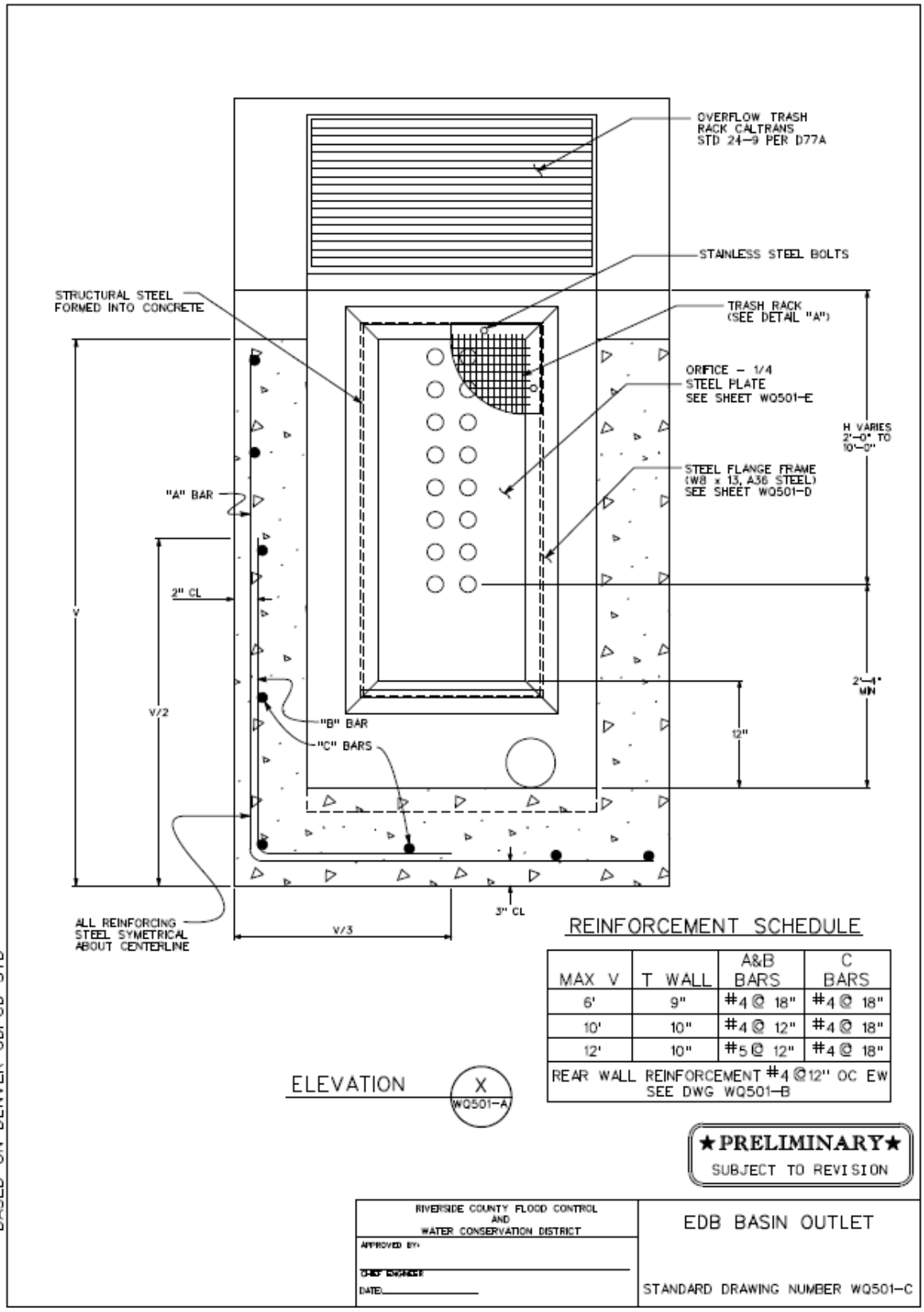
Embankments shall be designed in accordance with applicable standards of Riverside County Flood Control District's "Basin Guidelines" (Appendix C) or other guidelines issued by the Engineering Authority (EA). Where applicable, embankment designs must additionally conform to the requirements of the State of California Division of Safety of Dams.

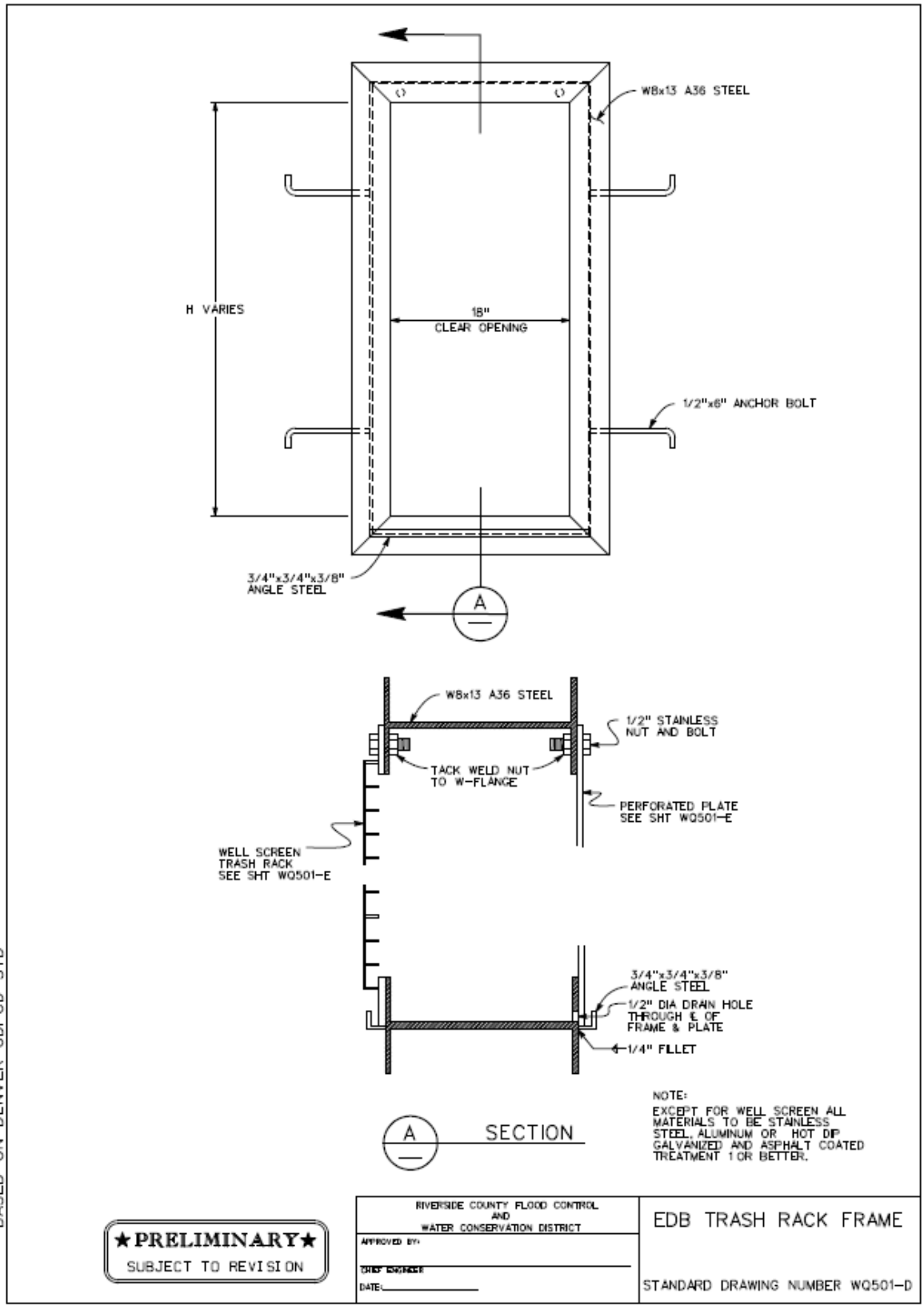
10. Spillway and Overflow Structures

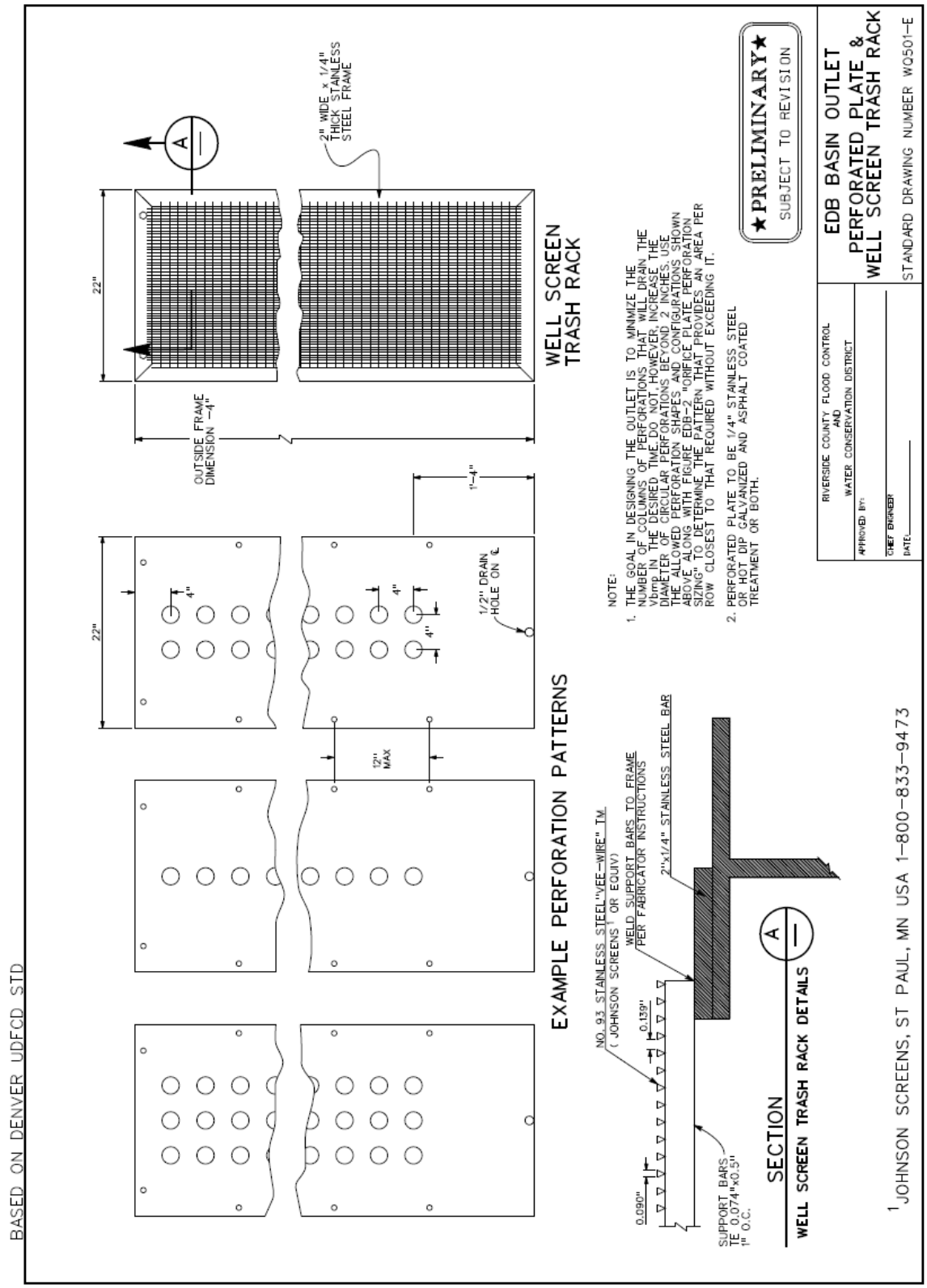
Spillway and overflow structures should be designed in accordance with applicable standards of the "Basin Guidelines" (Appendix C) or other guidelines issued by the Engineering Authority (EA).

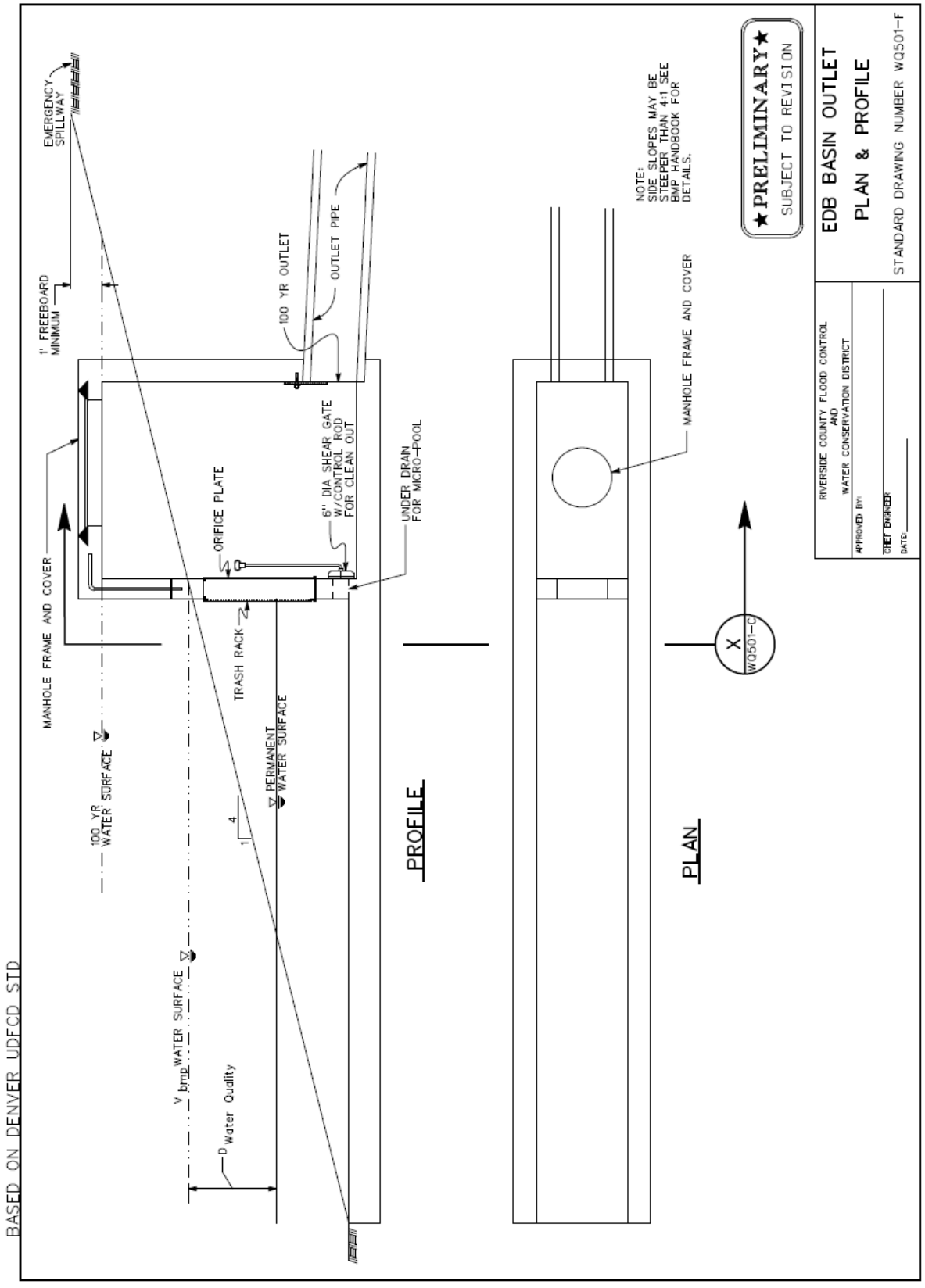

EDB BASIN OUTLET
PLAN & PROFILE
STANDARD DRAWING NUMBER WQ501-A
★PRELIMINARY★
SUBJECT TO REVISION
NOTE:
SIDE SLOPES MAY BE STEEPER THAN 4:1 SEE BMP HANDBOOK FOR DETAILS.
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVED BY:
CHIEF ENGINEER
DATE:
EMERGENCY SPILLWAY
1' FREEBOARD MINIMUM
100 YR WATER SURFACE
100 YR OUTLET
OUTLET PIPE
6" DIA SHEAR GATE W/CONTROL ROD FOR CLEAN OUT
UNDER DRAIN FOR MICRO-POOL
OVERFLOW TRASH RACK
ORIFICE PLATE
TRASH RACK
PERMANENT WATER SURFACE
WATER SURFACE
D Water Quality
PROFILE
PLAN
X
WQ501-C
BASED ON DENVER UDFCD STD

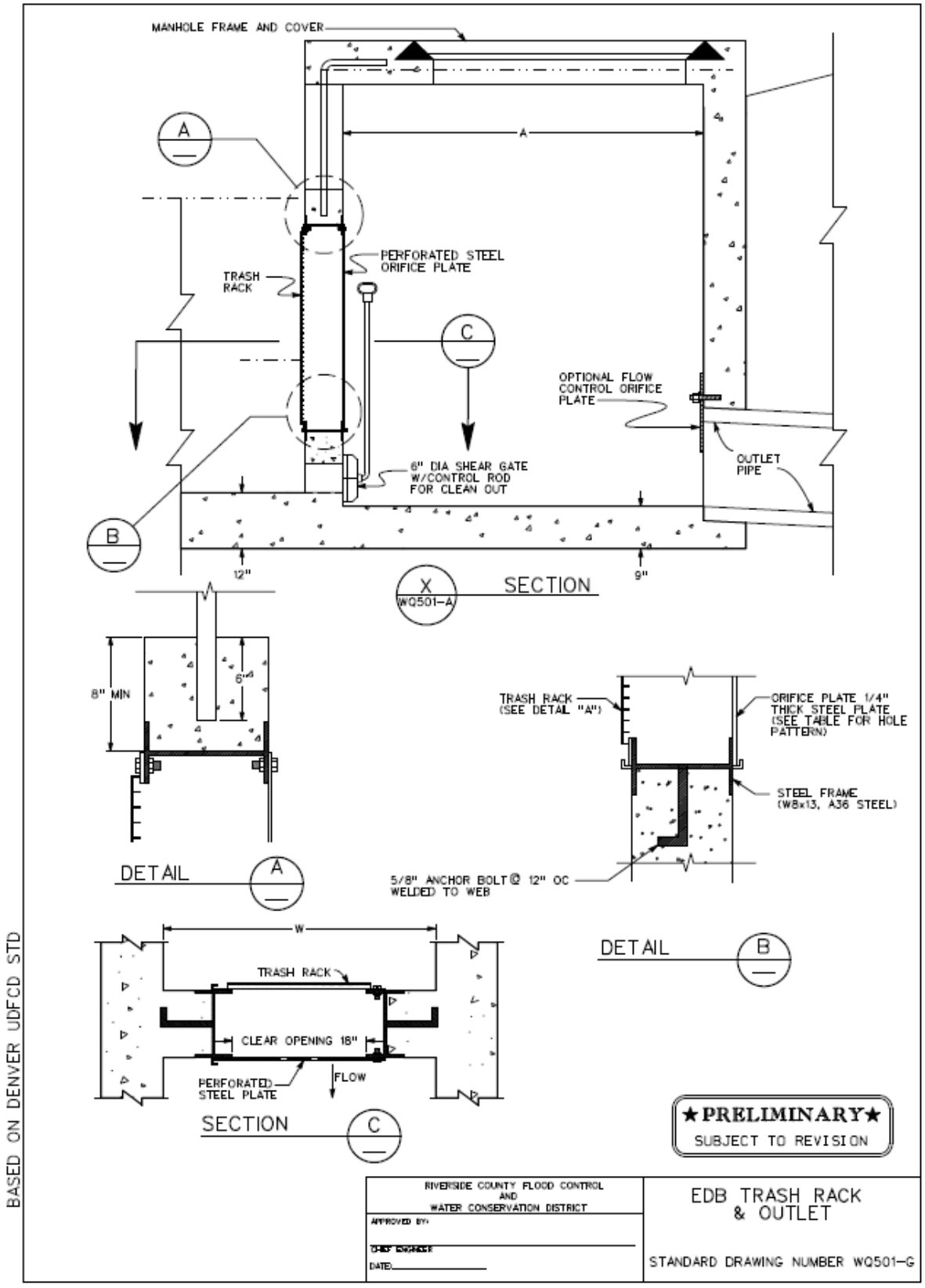

A
B
C
OVERFLOW TRASH RACK PER CALTRANS D77A
REAR WALL REINFORCEMENT #4 @ 12"OC EW
PERFORATED STEEL ORIFICE PLATE
TRASH RACK
2" CL
OPTIONAL FLOW CONTROL ORIFICE PLATE
6" DIA SHEAR GATE W/CONTROL ROD FOR CLEAN OUT
OUTLET PIPE
12"
9"
X
WQ501-A
SECTION
CALTRANS 24-9 GRATE PER STD D77A
6"
RECTANGULAR FRAME PER CALTRANS D77A
DETAIL A
TRASH RACK (SEE DETAIL "A")
ORIFICE PLATE 1/4" THICK STEEL PLATE (SEE TABLE FOR HOLE PATTERN)
STEEL FRAME (W8x13, A36 STEEL)
DETAIL B
35 3/8"
TRASH RACK
CLEAR OPENING 18"
FLOW
PERFORATED STEEL PLATE
SECTION C
★PRELIMINARY★
SUBJECT TO REVISION
BASED ON DENVER UDFCD STD
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVED BY:
DATE:
EDB TRASH RACK & OUTLET
STANDARD DRAWING NUMBER WQ501-B

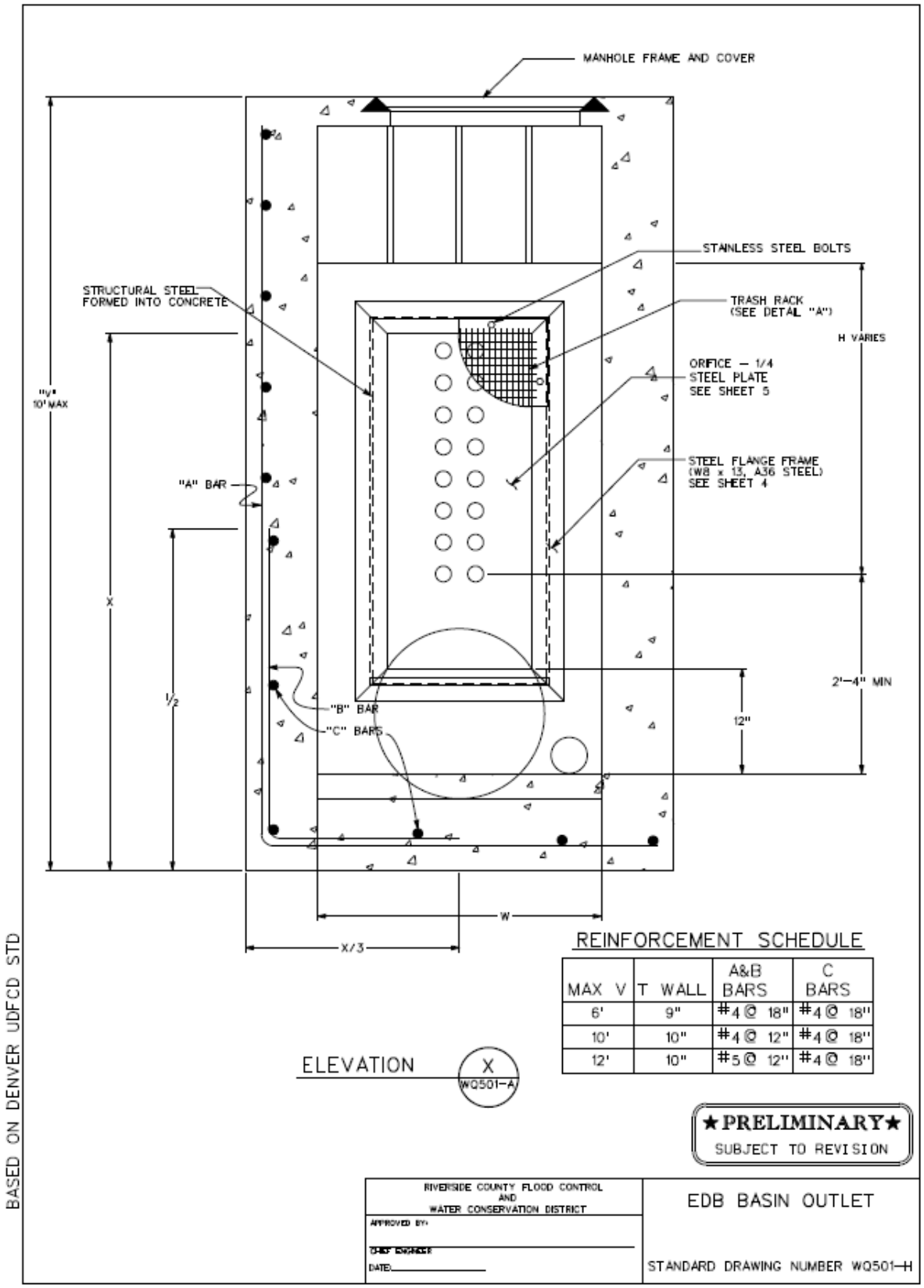

OVERFLOW TRASH RACK CALTRANS STD 24-9 PER D77A
STAINLESS STEEL BOLTS
STRUCTURAL STEEL FORMED INTO CONCRETE
TRASH RACK (SEE DETAIL "A")
ORIFICE - 1/4 STEEL PLATE SEE SHEET WQ501-E
H VARIES 2'-0" TO 10'-0"
STEEL FLANGE FRAME (W8 x 13, A36 STEEL) SEE SHEET WQ501-D
"A" BAR
2" CL
V
V/2
"B" BAR
"C" BARS
2'-4" MIN
12"
3" CL
ALL REINFORCING STEEL SYMETRICAL ABOUT CENTERLINE
V/3
BASED ON DENVER UDFCD STD
REINFORCEMENT SCHEDULE
MAX V | T WALL | A&B BARS | C BARS
6' | 9" | #4 @ 18" | #4 @ 18"
10' | 10" | #4 @ 12" | #4 @ 18"
12' | 10" | #5 @ 12" | #4 @ 18"
REAR WALL REINFORCEMENT #4 @12" OC EW SEE DWG WQ501-B
ELEVATION X WQ501-A
★PRELIMINARY★
SUBJECT TO REVISION
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVED BY:
CHIEF ENGINEER
DATE:
EDB BASIN OUTLET
STANDARD DRAWING NUMBER WQ501-C


W8x13 A36 STEEL
H VARIES
18"
CLEAR OPENING
1/2"x6" ANCHOR BOLT
3/4"x3/4"x3/8"
ANGLE STEEL
A
W8x13 A36 STEEL
1/2" STAINLESS
NUT AND BOLT
TACK WELD NUT
TO W-FLANGE
PERFORATED PLATE
SEE SHT WQ501-E
WELL SCREEN
TRASH RACK
SEE SHT WQ501-E
3/4"x3/4"x3/8"
ANGLE STEEL
1/2" DIA DRAIN HOLE
THROUGH ℄ OF
FRAME & PLATE
1/4" FILLET
A
SECTION
NOTE:
EXCEPT FOR WELL SCREEN ALL
MATERIALS TO BE STAINLESS
STEEL, ALUMINUM OR HOT DIP
GALVANIZED AND ASPHALT COATED
TREATMENT 1 OR BETTER.
BASED ON DENVER UDFCD STD
★PRELIMINARY★
SUBJECT TO REVISION
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
APPROVED BY:
CHIEF ENGINEER
DATE:
EDB TRASH RACK FRAME
STANDARD DRAWING NUMBER WQ501-D


BASED ON DENVER UDFCD STD
EXAMPLE PERFORATION PATTERNS
WELL SCREEN TRASH RACK
2" WIDE x 1/4" THICK STAINLESS STEEL FRAME
OUTSIDE FRAME DIMENSION -4"
22"
1'-4"
4"
1/2" DRAIN HOLE ON ℄
12" MAX
NOTE:
1. THE GOAL IN DESIGNING THE OUTLET IS TO MINIMIZE THE NUMBER OF COLUMNS OF PERFORATIONS THAT WILL DRAIN THE Vbmp IN THE DESIRED TIME. DO NOT, HOWEVER, INCREASE THE DIAMETER OF CIRCULAR PERFORATIONS BEYOND 2 INCHES. USE THE ALLOWED PERFORATION SHAPES AND CONFIGURATIONS SHOWN ABOVE ALONG WITH FIGURE EDB-2 "ORIFICE PLATE PERFORATION SIZING" TO DETERMINE THE PATTERN THAT PROVIDES AN AREA PER ROW CLOSEST TO THAT REQUIRED WITHOUT EXCEEDING IT.
2. PERFORATED PLATE TO BE 1/4" STAINLESS STEEL OR HOT DIP GALVANIZED AND ASPHALT COATED TREATMENT OR BOTH.
NO. 93 STAINLESS STEEL "VEE-WIRE" TM (JOHNSON SCREENS[1] OR EQUIV)
WELD SUPPORT BARS TO FRAME PER FABRICATOR INSTRUCTIONS
2"x1/4" STAINLESS STEEL BAR
0.139"
0.090"
SUPPORT BARS TE 0.074"x0.5" 1" O.C.
SECTION
WELL SCREEN TRASH RACK DETAILS
[1]JOHNSON SCREENS, ST PAUL, MN USA 1-800-833-9473
★PRELIMINARY★
SUBJECT TO REVISION
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVED BY:
CHIEF ENGINEER
DATE:
EDB BASIN OUTLET
PERFORATED PLATE & WELL SCREEN TRASH RACK
STANDARD DRAWING NUMBER WQ501-E


EDB BASIN OUTLET
PLAN & PROFILE
STANDARD DRAWING NUMBER WQ501-F
★PRELIMINARY★
SUBJECT TO REVISION
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVED BY:
CHIEF ENGINEER
DATE:
NOTE:
SIDE SLOPES MAY BE STEEPER THAN 4:1 SEE BMP HANDBOOK FOR DETAILS.
EMERGENCY SPILLWAY
1' FREEBOARD MINIMUM
100 YR OUTLET
OUTLET PIPE
6" DIA SHEAR GATE W/CONTROL ROD FOR CLEAN OUT
ORIFICE PLATE
UNDER DRAIN FOR MICRO-POOL
MANHOLE FRAME AND COVER
TRASH RACK
PERMANENT WATER SURFACE
100 YR WATER SURFACE
WATER SURFACE
V bmp
D Water Quality
4
1
PROFILE
PLAN
MANHOLE FRAME AND COVER
X
WQ501-C
BASED ON DENVER UDFCD STD


MANHOLE FRAME AND COVER
A
A
PERFORATED STEEL ORIFICE PLATE
TRASH RACK
C
OPTIONAL FLOW CONTROL ORIFICE PLATE
OUTLET PIPE
6" DIA SHEAR GATE W/CONTROL ROD FOR CLEAN OUT
B
12"
9"
X
WQ501-A
SECTION
8" MIN
6"
DETAIL A
TRASH RACK (SEE DETAIL "A")
ORIFICE PLATE 1/4" THICK STEEL PLATE (SEE TABLE FOR HOLE PATTERN)
STEEL FRAME (W8x13, A36 STEEL)
5/8" ANCHOR BOLT @ 12" OC WELDED TO WEB
DETAIL B
W
TRASH RACK
CLEAR OPENING 18"
PERFORATED STEEL PLATE
FLOW
SECTION C
★PRELIMINARY★
SUBJECT TO REVISION
BASED ON DENVER UDFCD STD
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVED BY:
DATE:
EDB TRASH RACK & OUTLET
STANDARD DRAWING NUMBER WQ501-G


MANHOLE FRAME AND COVER
STAINLESS STEEL BOLTS
STRUCTURAL STEEL FORMED INTO CONCRETE
TRASH RACK (SEE DETAIL "A")
H VARIES
ORIFICE – 1/4 STEEL PLATE SEE SHEET 5
"y" 10' MAX
STEEL FLANGE FRAME (W8 x 13, A36 STEEL) SEE SHEET 4
"A" BAR
X
1/2
"B" BAR
"C" BARS
2'–4" MIN
12"
W
X/3
BASED ON DENVER UDFCD STD
REINFORCEMENT SCHEDULE
MAX V
T WALL
A&B BARS
C BARS
6' 9" #4 @ 18" #4 @ 18"
10' 10" #4 @ 12" #4 @ 18"
12' 10" #5 @ 12" #4 @ 18"
ELEVATION X WQ501-A
★PRELIMINARY★
SUBJECT TO REVISION
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVED BY:
CHIEF ENGINEER
DATE:
EDB BASIN OUTLET
STANDARD DRAWING NUMBER WQ501–H

3.1 INFILTRATION BASIN

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evapotranspiration (when vegetated), Evaporation, and Sedimentation
Maximum Treatment Area	50 acres
Other Names	Bioinfiltration Basin

Description

An Infiltration Basin is a flat earthen basin designed to capture the design capture volume, V_{BMP}. The stormwater infiltrates through the bottom of the basin into the underlying soil over a 72 hour drawdown period. Flows exceeding V_{BMP} must discharge to a downstream conveyance system. Trash and sediment accumulate within the forebay as stormwater passes into the basin. Infiltration basins are highly effective in removing all targeted pollutants from stormwater runoff.

Figure 1 – Infiltration Basin

See Appendix A, and Appendix C, Section 1 of *Basin Guidelines*, for additional requirements.

Siting Considerations

The use of infiltration basins may be restricted by concerns over ground water contamination, soil permeability, and clogging at the site. See the applicable WQMP for any specific feasibility considerations for using infiltration BMPs. Where this BMP is being used, the soil beneath the basin must be thoroughly evaluated in a geotechnical report since the underlying soils are critical to the basin's long term performance. To protect the basin from erosion, the sides and bottom of the basin must be vegetated, preferably with native or low water use plant species.

In addition, these basins may not be appropriate for the following site conditions:

- Industrial sites or locations where spills of toxic materials may occur
- Sites with very low soil infiltration rates
- Sites with high groundwater tables or excessively high soil infiltration rates, where pollutants can affect ground water quality
- Sites with unstabilized soil or construction activity upstream
- On steeply sloping terrain
- Infiltration basins located in a fill condition should refer to Appendix A of this Handbook for details on special requirements/restrictions

Setbacks

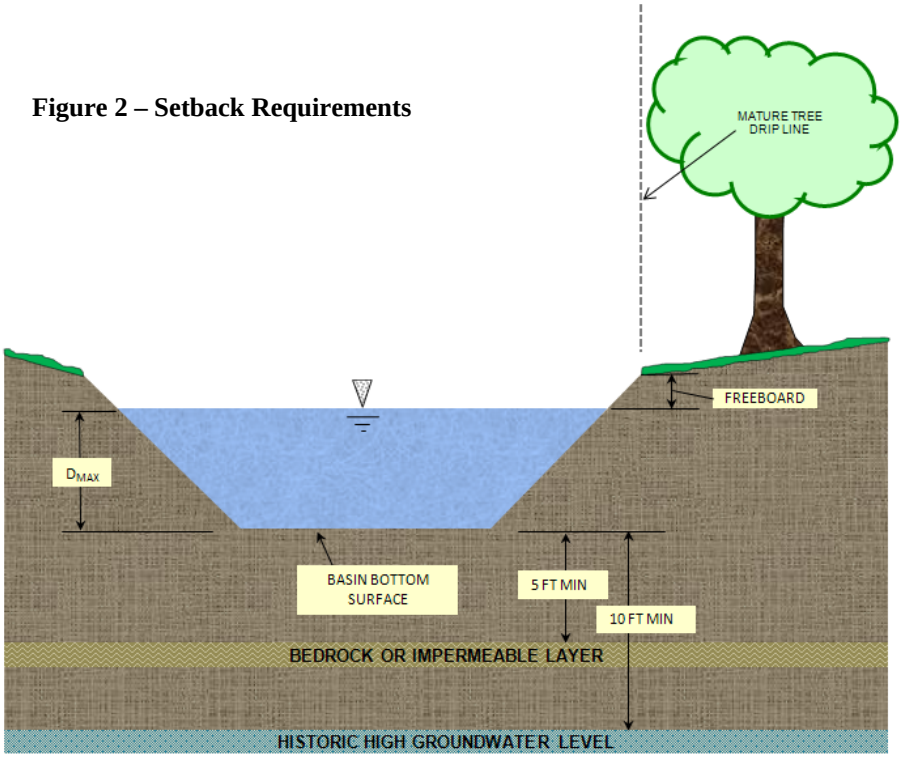
Always consult your geotechnical engineer for site specific recommendations regarding setbacks for infiltration trenches. Recommended setbacks are needed to protect buildings, existing trees, walls, onsite or nearby wells, streams, and tanks. Setbacks should be considered early in the design process since they can affect where infiltration facilities may be placed and how deep they are allowed to be. For instance, depth setbacks can dictate fairly shallow facilities that will have a larger footprint and, in some cases, may make an infiltration basin infeasible. In that instance, another BMP must be selected.

Infiltration basins typically must be set back:

- 10 feet from the historic high groundwater (measured vertically from the bottom of the basin, as shown in Figure 2)
- 5 feet from bedrock or impermeable surface layer (measured vertically from the bottom of the basin, as shown in Figure 2)
- From all existing mature tree drip lines as indicated in Figure 2 (to protect their root structure)
- 100 feet horizontally from wells, tanks or springs

Setbacks to walls and foundations must be included as part of the Geotechnical Report. All other setbacks shall be in accordance with applicable standards of the District's *Basin Guidelines* (Appendix C).

Figure 2 – Setback Requirements



Forebay

A concrete forebay shall be provided to reduce sediment clogging and to reduce erosion. The forebay shall have a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall / berm. Full height notch-type weir(s), offset from the line of flow from the basin inlet to prevent short circuiting, shall be used to outlet the forebay. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

Overflow

Flows exceeding V_{BMP} must discharge to an acceptable downstream conveyance system. Where an adequate outlet is present, an overflow structure may be used. Where an embankment is present, an emergency spillway may be used instead. Overflows must be placed just above the design water surface for V_{BMP} and be near the outlet of the system. The overflow structure shall be similar to the District's Standard Drawing CB 110. Additional details may be found in the District's *Basin Guidelines* (Appendix C).

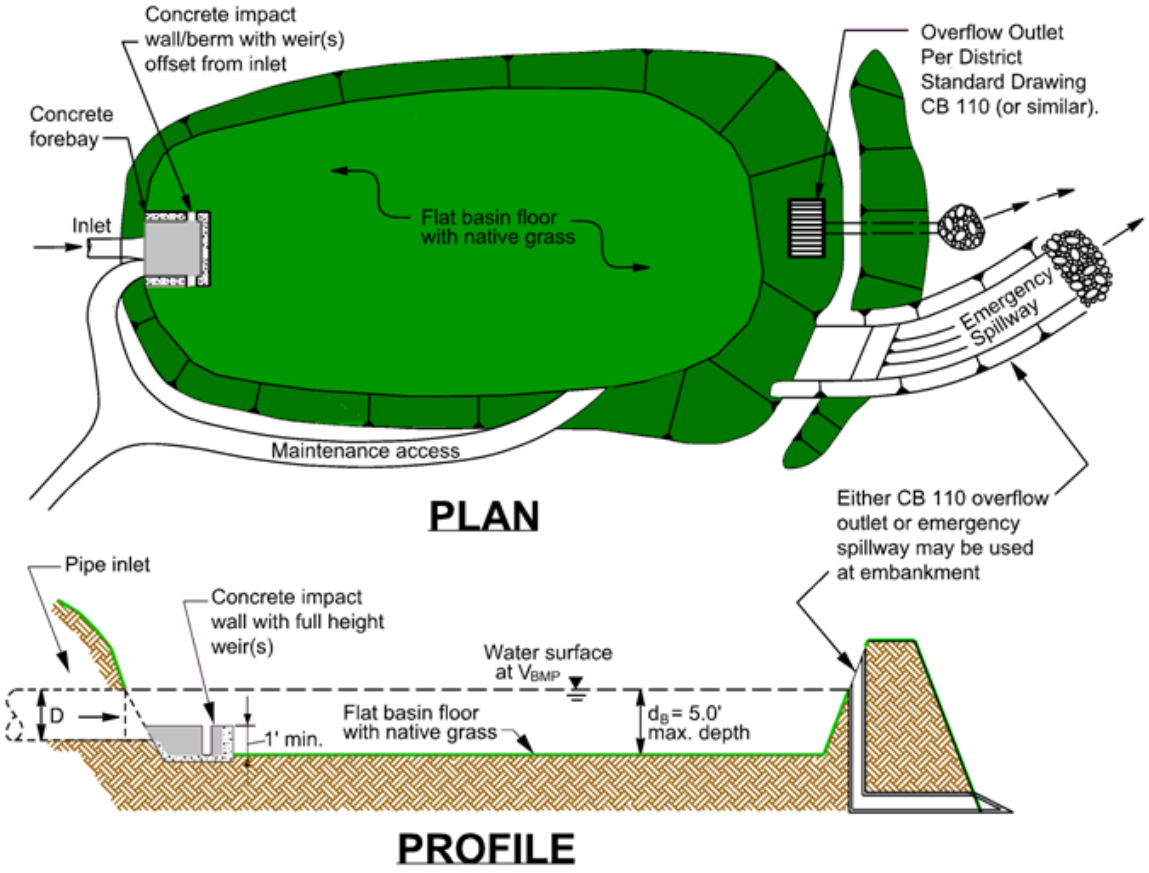


Figure 3 – Infiltration Basin

Landscaping Requirements

Basin vegetation provides erosion protection, improves sediment removal and assists in allowing infiltration to occur. The basin surface and side slopes shall be planted with native grasses. Proper landscape management is also required to ensure that the vegetation does not contribute to water pollution through pesticides, herbicides, or fertilizers. Landscaping shall be in accordance with County of Riverside Ordinance 859 and the District's *Basin Guidelines* (Appendix C), or other guidelines issued by the Engineering Authority.

Maintenance

Normal maintenance of an infiltration basin includes the maintenance of landscaping, debris and trash removal from the surface of the basin, and tending to problems associated with standing water (vectors, odors, etc.). Significant ponding, especially more than 72 hours after an event, may indicate that the basin surface is no longer providing sufficient infiltration and requires aeration. See the District's *Basin Guidelines* (Appendix C) for additional requirements (i.e., fencing, maintenance access, etc.).

Table 1 - Inspection and Maintenance

Schedule	Inspection and Maintenance Activity
Ongoing including just before annual storm seasons and following rainfall events.	• Maintain vegetation as needed. Use of fertilizers, pesticides and herbicides should be strenuously avoided to ensure they don't contribute to water pollution. If appropriate native plant selections and other IPM methods are used, such products shouldn't be needed. If such projects are used, o Products shall be applied in accordance with their labeling, especially in relation to application to water, and in areas subjected to flooding. o Fertilizers should not be applied within 15 days before, after, or during the rain season. • Remove debris and litter from the entire basin to minimize clogging and improve aesthetics. • Check for obvious problems and repair as needed. Address odor, insects, and overgrowth issues associated with stagnant or standing water in the basin bottom. There should be no long-term ponding water. • Check for erosion and sediment laden areas in the basin. Repair as needed. Clean forebay if needed. • Revegetate side slopes where needed.
Annually. If possible, schedule these inspections within 72 hours after a significant rainfall.	• Inspection of hydraulic and structural facilities. Examine the inlet for blockage, the embankment and spillway integrity, as well as damage to any structural element. • Check for erosion, slumping and overgrowth. Repair as needed. • Check basin depth for sediment build up and reduced total capacity. Scrape bottom as needed and remove sediment. Restore to original cross-section and infiltration rate. Replant basin vegetation. • Verify the basin bottom is allowing acceptable infiltration. Use a disc or other method to aerate basin bottom only if there is actual significant loss of infiltrative capacity, rather than on a routine basis[1]. • No water should be present 72 hours after an event. No long term standing water should be present at all. No algae formation should be visible. Correct problem as needed.

1. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**

Table 2 - Design and Sizing Criteria for Infiltration Basins

Design Parameter	Infiltration Basin
Design Volume	V_{BMP}
Forebay Volume	0.5% V_{BMP}
Drawdown time (maximum)	72 hours
Maximum tributary area	50 acres [2]
Minimum infiltration rate	Must be sufficient to drain the basin within the required Drawdown time over the life of the BMP. The WQMP may include specific requirements for minimum tested infiltration rates.
Maximum Depth	5 feet
Spillway erosion control	Energy dissipators to reduce velocities[1]
Basin Slope	0%
Freeboard (minimum)	1 foot [1]
Historic High Groundwater Setback (max)	10 feet
Bedrock/impermeable layer setback (max)	5 feet
Tree setbacks	Mature tree drip line must not overhang the basin
Set back from wells, tanks or springs	100 feet
Set back from foundations	As recommended in Geotechnical Report

1. **Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures**
2. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**

Note: The information contained in this BMP Factsheet is intended to be a summary of design considerations and requirements. Additional information which applies to all detention basins may be found in the District's Basin Guidelines (Appendix C). In addition, information herein may be superseded by other guidelines issued by the co-permittee.

INFILTRATION BASIN SIZING PROCEDURE

1. Find the Design Volume, V_{BMP}.
   a) Enter the Tributary Area, $A_{T.}$
   b) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.
2. Determine the Maximum Depth.
   a) Enter the infiltration rate. The infiltration rate shall be established as described in Appendix A: "Infiltration Testing".
   b) Enter the design Factor of Safety from Table 1 in Appendix A: "Infiltration Testing".
   c) The spreadsheet will determine D_1, the maximum allowable depth of the basin based on the infiltration rate along with the maximum drawdown time (72 hours) and the Factor of Safety.

$$D_1 = [(t) \times (I)] / 12s$$

Where I = site infiltration rate (in/hr)
s = safety factor
t = drawdown time (maximum 72 hours)

d) Enter the depth of freeboard.

e) Enter the depth to the historic high groundwater level measured from the top of the basin.

f) Enter the depth to the top of bedrock or other impermeable layer measured from the finished grade.

g) The spreadsheet will determine D_2, the total basin depth (including freeboard, if used) of the basin, based on restrictions to the depth by groundwater and an impermeable layer.

D_2 = Depth to groundwater – (10 + freeboard) (ft);

or

D_2 = Depth to impermeable layer – (5 + freeboard) (ft)

Whichever is least.

h) The spreadsheet will determine the maximum allowable effective depth of basin, D_{MAX}, based on the smallest value between D_1 and D_2. D_{MAX} is the maximum depth of water only and does not include freeboard. D_{MAX} shall not exceed 5 feet.

3. Basin Geometry

a) Enter the basin side slopes, z (no steeper than 4:1).

b) Enter the proposed basin depth, d_B excluding freeboard.

c) The spreadsheet will determine the minimum required surface area of the basin:

$$A_s = V_{BMP} / d_B$$

Where A_s = minimum area required (ft^2)
V_{BMP} = volume of the infiltration basin (ft^3)
d_B= proposed depth not to exceed maximum allowable depth, D_{MAX} (ft)

d) Enter the proposed bottom surface area. This area shall not be less than the minimum required surface area.

4. Forebay

A concrete forebay with a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall shall be provided. Full-height rectangular weir(s) shall be used to outlet the forebay. The weir(s) must be offset from the line of flow from the basin inlet. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

a) The spreadsheet will determine the minimum required forebay volume based on 0.5% V_{BMP}.

b) Enter the proposed depth of the forebay berm/splashwall (1foot minimum).

c) The spreadsheet will determine the minimum required forebay surface area.

d) Enter the width of rectangular weir to be used (minimum 1.5 inches). Weir width should be established based on a 5 minute drawdown time.

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
EXISTING CONDITION

PREPARED BY:

HUNSAKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

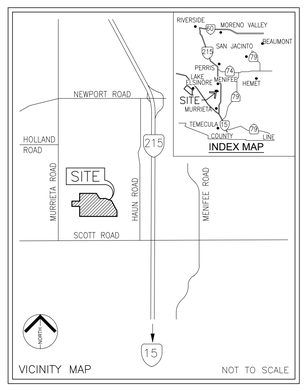
DATE PREPARED: MARCH 2019

N
W HUNSAKER E
S

1" = 200'
100 0 200

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
- D-9 / 5.08 — AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} = 40.5 cfs / Q_{100} = 72.8 cfs / Tc=11.8 MIN. / INV= x — 10 YEAR STORM FLOW / 100 YEAR STORM FLOW / TIME OF CONCENTRATION (Q100) / INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs / ΣQ_{100} = 72.8 cfs / Tc=11.8 MIN. / INV= x — 10 YEAR STORM FLOW CONFLUENCE / 100 YEAR STORM FLOW CONFLUENCE / TIME OF CONCENTRATION (Q100) / INVERT ELEVATION
- **AREA "B"** — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID

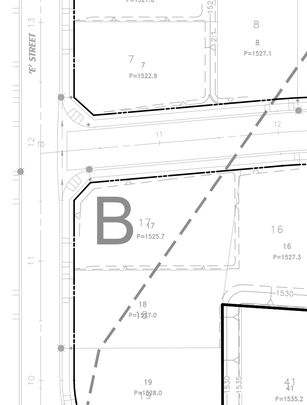


PLOTTED BY: Brian Lowell DATE: May 18, 2021 07:50:36 PM FILE: I:\05540\Planning\Drainage Facts\Maps\05540-SHT-01-HYD-EX.dwg

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'A' - PROPOSED DEVELOPMENT

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
- D-9 / 5.08 — AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} = 40.5 cfs; Q_{100} = 72.8 cfs; Tc = 11.8 MIN.; INV = x — 10 YEAR STORM FLOW; 100 YEAR STORM FLOW; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs; ΣQ_{100} = 72.8 cfs; Tc = 11.8 MIN.; INV = x — 10 YEAR STORM FLOW CONFLUENCE; 100 YEAR STORM FLOW CONFLUENCE; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- **AREA "B"** — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID



N / W HUNSAKER E / S

1" = 60'
30 0 60

PREPARED BY:

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INLAND EMPIRE REGION
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PREPARED BY:

MATCHLINE (SEE SHEET 2)

PLOTTED BY: Joanna Smolkowski DATE: Nov. 08, 2021 11:15:58 AM FILE: H:\1000-69 Planning\Drainage\Porto\Mapp\AREA A-HYD MAP.dwg

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'A' - PROPOSED DEVELOPMENT

N
W HUNSKER E
S

1" = 60'
30 0 60

PREPARED BY:

HUNSKER & ASSOCIATES
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INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

PREPARED ON: MARCH 2019

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
- D-9 / 5.08 — AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} = 40.5 cfs; Q_{100} = 72.8 cfs; Tc = 11.8 MIN.; INV = x — 10 YEAR STORM FLOW / 100 YEAR STORM FLOW / TIME OF CONCENTRATION (Q100) / INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs; ΣQ_{100} = 72.8 cfs; Tc = 11.8 MIN.; INV = x — 10 YEAR STORM FLOW CONFLUENCE / 100 YEAR STORM FLOW CONFLUENCE / TIME OF CONCENTRATION (Q100) / INVERT ELEVATION
- AREA "B" — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID

DMA 'A'

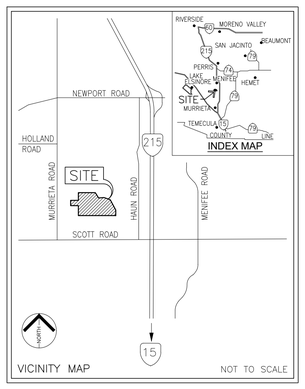
LL=5,833'
LC=2,440'

DRAINAGE AREA C
SHEET SHEET 4
1.3 AC

MATCHLINE (SEE SHEET 1)

PLOTTED BY: Joanna Swiatkowska DATE: Nov. 08, 2021 11:30:14 AM FILE: H:\(00546)\Planning\Drainage\Parts\Maps\AREA A-HYD MAP.dwg

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'C' - PROPOSED DEVELOPMENT



PREPARED BY:

HUNSAKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

DATE PREPARED: MARCH 2019

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY (B / C)
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
- D-9 / 5.08 — AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} = 40.5 cfs, Q_{100} = 72.8 cfs — 10 YEAR STORM FLOW / 100 YEAR STORM FLOW
- Tc=11.8 MIN. — TIME OF CONCENTRATION (Q100)
- INV=x — INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs, ΣQ_{100} = 72.8 cfs — 10 YEAR STORM FLOW CONFLUENCE / 100 YEAR STORM FLOW CONFLUENCE
- Tc=11.8 MIN. — TIME OF CONCENTRATION (Q100)
- INV=x — INVERT ELEVATION
- AREA "B" — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID

N W E S HUNSAKER

1" = 60'
30 0 60

DRAINAGE AREA A
SEE SHEET 2

DRAINAGE AREA A
SEE SHEET 2

309
1719.9

312
1595.0

300
1566.1

C-4
2.44

C-1
1.27

C-2
2.43

C-6
2.69

310
1580.0
Q_{10} = 4.5 cfs
Q_{100} = 7.3 cfs
Tc=9.6 MIN.

LL=1,178'
LC=347'

301
1554.0
Q_{10} = 2.15 cfs
Q_{100} = 3.64 cfs
Tc=9.9 MIN.
INV=1546.0

303
1554.0
Q_{10} = 4.0 cfs
Q_{100} = 6.8 cfs
Tc=10.3 MIN.
INV=1546.0

302
1553.0
ΣQ_{10} = 6.1 cfs
ΣQ_{100} = 10.4 cfs
Tc=10.3 MIN.
INV=1545.0

C-3
1.37

307
1551.9

304
1553.5
Q_{10} = 8.2 cfs
Q_{100} = 13.9 cfs
Tc=10.8 MIN.
INV=1540.0

305
1553.5
Q_{10} = 2.1 cfs
Q_{100} = 3.7 cfs
Tc=11.2 MIN.
INV=1540.2

306.1
1535.0
Q_{10} = 8.2 cfs
Q_{100} = 13.9 cfs
Tc=11.1 MIN.
INV=1535.0

306.3
1535.0
Q_{10} = 9.1 cfs
Q_{100} = 15.1 cfs
Tc=10.2 MIN.

ΣQ_{10} = 22.1 cfs
ΣQ_{100} = 36.9 cfs
T_c = 10.2 MIN.

C-9
0.76

C-7
3.23

308
1538.6
Q_{10} = 4.9 cfs
Q_{100} = 8.3 cfs
Tc=12.3 MIN.
INV=1532.0

306.2
1531.0
Q_{10} = 4.9 cfs
Q_{100} = 8.3 cfs
Tc=12.4 MIN.
INV=1531.0

"EE" ST
"FF" ST
"GG" STREET
"HH" STREET
"II" STREET
"JJ" ST
"KK" ST
"LL" STREET
"MM" ST
"O" STREET
"P" STREET
"A" STREET
"K" STREET
"Z" STREET
WICKERD ROAD
LOT C PARKING
LOT I PVT DWY
ACCESS ROAD

PLOTTED BY: Joanna Swiatkowska DATE: Nov 08, 2021 02:37:25 PM FILE: H:\00046\Planning\Drainage\Parts\Maps\AREA C-HYD (MP).dwg

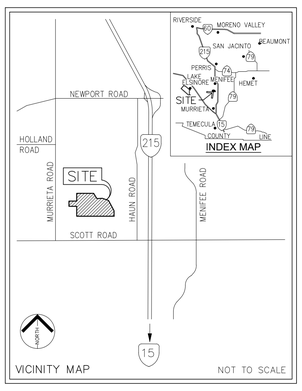
MATCHLINE (SEE BELOW)

MATCHLINE (SEE SHEET 3)

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'D' - PROPOSED DEVELOPMENT

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
- D-9 / 5.08 — AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} = 40.5 cfs; Q_{100} = 72.8 cfs; Tc=11.8 MIN.; INV=x — 10 YEAR STORM FLOW; 100 YEAR STORM FLOW; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs; ΣQ_{100} = 72.8 cfs; Tc=11.8 MIN.; INV=x — 10 YEAR STORM FLOW CONFLUENCE; 100 YEAR STORM FLOW CONFLUENCE; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- **AREA "B"** — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID



N / W HUNSAKER E / S

1" = 60'

PREPARED BY:

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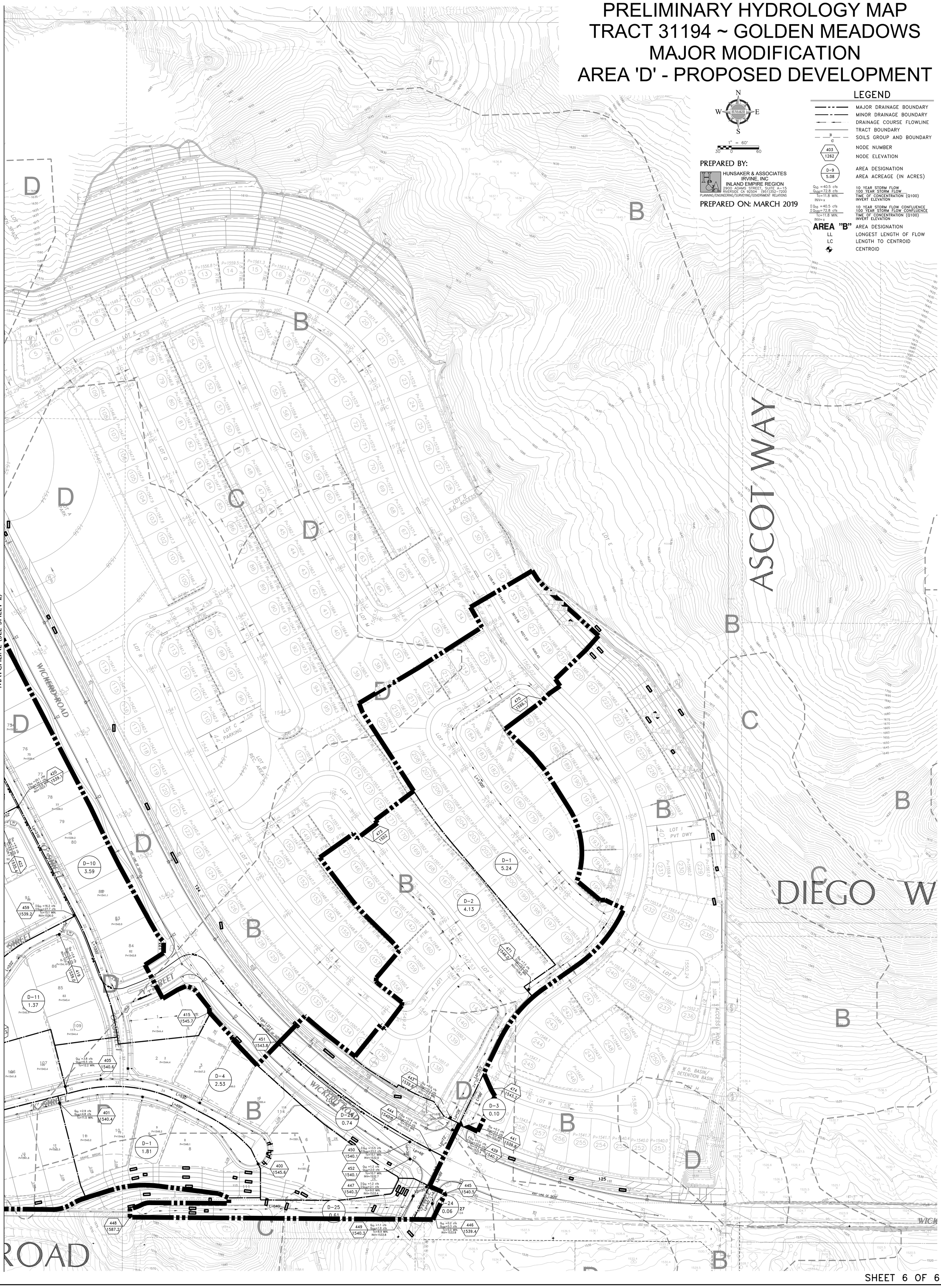
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE, CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

PREPARED BY:

MATCHLINE (SEE ABOVE)

PLOTTED BY: Brian Lowell DATE: May 18, 2021 11:00:26 PM FILE: H:\30546\Planning Drainage\Perris Maps\30546 - SHT-02-HY-PRE-D-MOD.dwg

PRELIMINARY HYDROLOGY MAP
TRACT 31194 ~ GOLDEN MEADOWS
MAJOR MODIFICATION
AREA 'D' - PROPOSED DEVELOPMENT



N
W HUNSAKER E
S

1" = 60'
30 0 60

PREPARED BY:

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2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

PREPARED ON: MARCH 2019

LEGEND

- MAJOR DRAINAGE BOUNDARY
- MINOR DRAINAGE BOUNDARY
- DRAINAGE COURSE FLOWLINE
- TRACT BOUNDARY
- SOILS GROUP AND BOUNDARY
- 403 / 1262 — NODE NUMBER / NODE ELEVATION
- D-9 / 5.08 — AREA DESIGNATION / AREA ACREAGE (IN ACRES)
- Q_{10} = 40.5 cfs; Q_{100} = 72.8 cfs; Tc=11.8 MIN.; INV=x — 10 YEAR STORM FLOW; 100 YEAR STORM FLOW; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- ΣQ_{10} = 40.5 cfs; ΣQ_{100} = 72.8 cfs; Tc=11.8 MIN.; INV=x — 10 YEAR STORM FLOW CONFLUENCE; 100 YEAR STORM FLOW CONFLUENCE; TIME OF CONCENTRATION (Q100); INVERT ELEVATION
- AREA "B" — AREA DESIGNATION
- LL — LONGEST LENGTH OF FLOW
- LC — LENGTH TO CENTROID
- CENTROID

MATCHLINE (SEE SHEET 2)

EDITED BY: Joanna Swiatkowska DATE: Nov. 10, 2021 12:54:14 PM FILE: H:\00546\Planning\Drainage\Parts\Maps\00546-SHT-02-HY-PRE-D-MOD.dwg

```
               Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
       Rational Hydrology Study        Date: 04/30/21  File:EXA002.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'A'
EXISTING CONDITION RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.550(In/Hr)
Slope of intensity duration curve = 0.5300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   800.000(Ft.)
Top (of initial area) elevation =  1758.000(Ft.)
Bottom (of initial area) elevation =  1590.000(Ft.)
Difference in elevation =   168.000(Ft.)
Slope =    0.21000  s(percent)=      21.00
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.497 min.
Rainfall intensity =      1.386(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.554
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      6.021(CFS)
Total initial stream area =        7.850(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1590.000(Ft.)
End of natural channel elevation =   1533.000(Ft.)
Length of natural channel  =  1213.000(Ft.)
```

```
Estimated mean flow rate at midpoint of channel =     22.099(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   6.67(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0470
Corrected/adjusted channel slope =  0.0470
Travel time =    3.03 min.     TC =   13.53  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.554
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.050
Decimal fraction soil group D = 0.200
RI index for soil(AMC 1)  =  63.84
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.211(In/Hr) for a     2.0 year storm
Subarea runoff =     28.150(CFS) for     41.920(Ac.)
Total runoff =     34.171(CFS)       Total area =      49.770(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1533.000(Ft.)
End of natural channel elevation =   1514.000(Ft.)
Length of natural channel  =  1843.000(Ft.)
Estimated mean flow rate at midpoint of channel =     59.437(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   4.13(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0103
Corrected/adjusted channel slope =  0.0103
Travel time =    7.43 min.     TC =   20.96  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.580
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.650
RI index for soil(AMC 1)  =  71.52
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.960(In/Hr) for a     2.0 year storm
Subarea runoff =     40.967(CFS) for     73.600(Ac.)
Total runoff =     75.138(CFS)       Total area =     123.370(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    123.370(Ac.)
Runoff from this stream =     75.138(CFS)
Time of concentration =   20.96 min.
```

```
Rainfall intensity =     0.960(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   790.000(Ft.)
Top (of initial area) elevation =  1543.000(Ft.)
Bottom (of initial area) elevation =  1522.000(Ft.)
Difference in elevation =    21.000(Ft.)
Slope =    0.02658  s(percent)=       2.66
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.791 min.
Rainfall intensity =      1.116(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.614
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.750
RI index for soil(AMC 1)  =  72.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      4.457(CFS)
Total initial stream area =        6.500(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      104.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of natural channel elevation =   1519.000(Ft.)
End of natural channel elevation =   1514.000(Ft.)
Length of natural channel  =   634.000(Ft.)
Estimated mean flow rate at midpoint of channel =     10.738(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   2.26(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0079
Corrected/adjusted channel slope =  0.0079
Travel time =    4.68 min.     TC =   20.47  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.546
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  67.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.973(In/Hr) for a     2.0 year storm
Subarea runoff =      9.730(CFS) for     18.320(Ac.)
Total runoff =     14.187(CFS)       Total area =      24.820(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      104.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     24.820(Ac.)
Runoff from this stream =     14.187(CFS)
Time of concentration =   20.47 min.
```

```
Rainfall intensity =     0.973(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       75.138     20.96                0.960
2       14.187     20.47                0.973
Largest stream flow has longer time of concentration
Qp =     75.138 + sum of
          Qb         Ia/Ib
          14.187 *    0.987 =     14.009
Qp =     89.146

Total of 2 streams to confluence:
Flow rates before confluence point:
      75.138      14.187
Area of streams before confluence:
      123.370       24.820
Results of confluence:
Total flow rate =     89.146(CFS)
Time of concentration =    20.961 min.
Effective stream area after confluence =    148.190(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      107.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1514.000(Ft.)
End of natural channel elevation =   1504.000(Ft.)
Length of natural channel  =   897.000(Ft.)
Estimated mean flow rate at midpoint of channel =     96.678(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   4.96(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0111
Corrected/adjusted channel slope =  0.0111
Travel time =    3.01 min.     TC =   23.97  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.531
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  68.18
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.894(In/Hr) for a     2.0 year storm
Subarea runoff =     11.886(CFS) for     25.040(Ac.)
Total runoff =    101.032(CFS)       Total area =     173.230(Ac.)
End of computations, total study area =          173.23 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  83.7
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              Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
       Rational Hydrology Study        Date: 11/08/21  File:PR002.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'A'
DEVELOPED CONDITION RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

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Program License Serial Number 6406

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Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.550(In/Hr)
Slope of intensity duration curve = 0.5300




++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station      101.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   448.000(Ft.)
Top (of initial area) elevation =  1800.000(Ft.)
Bottom (of initial area) elevation =  1660.000(Ft.)
Difference in elevation =   140.000(Ft.)
Slope =    0.31250  s(percent)=      31.25
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.688 min.
Rainfall intensity =      1.634(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.588
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.152(CFS)
Total initial stream area =        3.280(Ac.)
Pervious area fraction = 1.000
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of natural channel elevation =   1660.000(Ft.)
End of natural channel elevation =   1565.300(Ft.)
Length of natural channel  =   618.000(Ft.)
Estimated mean flow rate at midpoint of channel =      7.534(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   8.61(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.1532
Corrected/adjusted channel slope =  0.1366
Travel time =    1.20 min.     TC =    8.88  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.572
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.514(In/Hr) for a     2.0 year storm
Subarea runoff =      7.899(CFS) for      9.120(Ac.)
Total runoff =     11.051(CFS)   Total area =      12.400(Ac.)


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Process from Point/Station      102.000 to Point/Station      102.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1565.300(Ft.)
Downstream point/station elevation =  1563.000(Ft.)
Pipe length  =   123.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.051(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.051(CFS)
Normal flow depth in pipe =   11.84(In.)
Flow top width inside pipe =   17.08(In.)
Critical Depth =   15.27(In.)
Pipe flow velocity =      8.96(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =     9.11 min.


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Process from Point/Station      102.100 to Point/Station      102.100
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.624
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
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Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Time of concentration =     9.11 min.
Rainfall intensity =      1.493(In/Hr) for a     2.0 year storm
Subarea runoff =      0.960(CFS) for      1.030(Ac.)
Total runoff =     12.011(CFS)   Total area =      13.430(Ac.)


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Process from Point/Station      102.100 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1563.000(Ft.)
Downstream point/station elevation =  1549.000(Ft.)
Pipe length  =   671.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.011(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    12.011(CFS)
Normal flow depth in pipe =   12.09(In.)
Flow top width inside pipe =   16.90(In.)
Critical Depth =   15.76(In.)
Pipe flow velocity =      9.52(Ft/s)
Travel time through pipe =    1.17 min.
Time of concentration (TC) =    10.29 min.


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Process from Point/Station      102.100 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.430(Ac.)
Runoff from this stream =     12.011(CFS)
Time of concentration =   10.29 min.
Rainfall intensity =     1.400(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       12.011     10.29                1.400
Largest stream flow has longer time of concentration
Qp =     12.011 + sum of
Qp =     12.011

Total of 1 streams to confluence:
Flow rates before confluence point:
      12.011
Area of streams before confluence:
       13.430
Results of confluence:
Total flow rate =     12.011(CFS)
Time of concentration =    10.288 min.
Effective stream area after confluence =     13.430(Ac.)


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Process from Point/Station      104.000 to Point/Station      105.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   425.000(Ft.)
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Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1556.200(Ft.)
Difference in elevation =    15.800(Ft.)
Slope =    0.03718  s(percent)=       3.72
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.479 min.
Rainfall intensity =      1.551(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.628
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.926(CFS)
Total initial stream area =        0.950(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      105.000 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1549.200(Ft.)
Downstream point/station elevation =  1549.000(Ft.)
Pipe length  =    15.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.926(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.926(CFS)
Normal flow depth in pipe =    4.42(In.)
Flow top width inside pipe =    9.00(In.)
Critical Depth =    5.29(In.)
Pipe flow velocity =      4.29(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =     8.54 min.


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Process from Point/Station      105.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.950(Ac.)
Runoff from this stream =      0.926(CFS)
Time of concentration =    8.54 min.
Rainfall intensity =     1.546(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       12.011     10.29                1.400
2        0.926      8.54                1.546
Largest stream flow has longer time of concentration
Qp =     12.011 + sum of
         Qb         Ia/Ib
          0.926 *    0.906 =      0.839
Qp =     12.849

Total of 2 streams to confluence:
Flow rates before confluence point:
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      12.011       0.926
Area of streams before confluence:
       13.430        0.950
Results of confluence:
Total flow rate =     12.849(CFS)
Time of concentration =    10.288 min.
Effective stream area after confluence =     14.380(Ac.)


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Process from Point/Station      103.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1549.000(Ft.)
Downstream point/station elevation =  1548.700(Ft.)
Pipe length  =    29.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.849(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    12.849(CFS)
Normal flow depth in pipe =   14.18(In.)
Flow top width inside pipe =   19.67(In.)
Critical Depth =   16.03(In.)
Pipe flow velocity =      7.44(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    10.35 min.


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Process from Point/Station      103.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     14.380(Ac.)
Runoff from this stream =     12.849(CFS)
Time of concentration =   10.35 min.
Rainfall intensity =     1.396(In/Hr)


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Process from Point/Station      104.000 to Point/Station      107.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   553.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1564.600(Ft.)
Difference in elevation =     7.400(Ft.)
Slope =    0.01338  s(percent)=       1.34
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.557 min.
Rainfall intensity =      1.317(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.611
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.949(CFS)
Total initial stream area =        1.180(Ac.)
Pervious area fraction = 0.500
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Process from Point/Station      107.000 to Point/Station      108.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
_____________________________________________________________________________
Top of street segment elevation =  1564.600(Ft.)
End of street segment elevation =  1556.200(Ft.)
Length of street segment  =   684.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      1.553(CFS)
Depth of flow =   0.269(Ft.), Average velocity =   2.459(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   7.105(Ft.)
Flow velocity =   2.46(Ft/s)
Travel time =    4.64 min.     TC =   16.19  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.612
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.050
Decimal fraction soil group D = 0.200
RI index for soil(AMC 1)  =  40.45
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.101(In/Hr) for a     2.0 year storm
Subarea runoff =      1.152(CFS) for      1.710(Ac.)
Total runoff =      2.101(CFS)   Total area =       2.890(Ac.)
Street flow at end of street =      2.101(CFS)
Half street flow at end of street =      2.101(CFS)
Depth of flow =   0.291(Ft.), Average velocity =   2.621(Ft/s)
Flow width (from curb towards crown)=   8.214(Ft.)


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Process from Point/Station      108.000 to Point/Station      106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________________
Upstream point/station elevation =  1549.200(Ft.)
Downstream point/station elevation =  1548.700(Ft.)
Pipe length  =    42.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.101(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.101(CFS)
Normal flow depth in pipe =    6.28(In.)
Flow top width inside pipe =   11.99(In.)
Critical Depth =    7.43(In.)
Pipe flow velocity =      5.04(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =    16.33 min.


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Process from Point/Station      108.000 to Point/Station      106.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.890(Ac.)
Runoff from this stream =      2.101(CFS)
Time of concentration =   16.33 min.
Rainfall intensity =     1.096(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       12.849     10.35                1.396
2        2.101     16.33                1.096
Largest stream flow has longer or shorter time of concentration
Qp =     12.849 + sum of
         Qa          Tb/Ta
          2.101 *    0.634 =      1.332
Qp =     14.181

Total of 2 streams to confluence:
Flow rates before confluence point:
      12.849       2.101
Area of streams before confluence:
       14.380        2.890
Results of confluence:
Total flow rate =     14.181(CFS)
Time of concentration =    10.353 min.
Effective stream area after confluence =     17.270(Ac.)


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Process from Point/Station      106.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  1548.700(Ft.)
Downstream point/station elevation =  1523.000(Ft.)
Pipe length  =   620.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.181(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    14.181(CFS)
Normal flow depth in pipe =   10.71(In.)
Flow top width inside pipe =   17.67(In.)
Critical Depth =   16.64(In.)
Pipe flow velocity =     12.94(Ft/s)
Travel time through pipe =    0.80 min.
Time of concentration (TC) =    11.15 min.


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Process from Point/Station      106.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     17.270(Ac.)
Runoff from this stream =     14.181(CFS)
Time of concentration =   11.15 min.
Rainfall intensity =     1.342(In/Hr)


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Process from Point/Station      110.000 to Point/Station      111.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   530.000(Ft.)
Top (of initial area) elevation =  1540.000(Ft.)
Bottom (of initial area) elevation =  1530.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01887  s(percent)=       1.89
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.312 min.
Rainfall intensity =      1.003(In/Hr) for a     2.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.529
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.150
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.850
RI index for soil(AMC 1)  =  65.45
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.560(CFS)
Total initial stream area =        2.940(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      111.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1523.400(Ft.)
Downstream point/station elevation =  1523.000(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.560(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.560(CFS)
Normal flow depth in pipe =    6.95(In.)
Flow top width inside pipe =    7.55(In.)
Critical Depth =    6.90(In.)
Pipe flow velocity =      4.26(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    19.47 min.


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Process from Point/Station      111.000 to Point/Station      109.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.940(Ac.)
Runoff from this stream =      1.560(CFS)
Time of concentration =   19.47 min.
Rainfall intensity =     0.999(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       14.181     11.15                1.342
2        1.560     19.47                0.999
Largest stream flow has longer or shorter time of concentration
Qp =     14.181 + sum of
         Qa          Tb/Ta
          1.560 *    0.573 =      0.893
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Qp =     15.074

Total of 2 streams to confluence:
Flow rates before confluence point:
      14.181       1.560
Area of streams before confluence:
       17.270        2.940
Results of confluence:
Total flow rate =     15.074(CFS)
Time of concentration =    11.151 min.
Effective stream area after confluence =     20.210(Ac.)


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Process from Point/Station      109.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1523.000(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.074(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    15.074(CFS)
Normal flow depth in pipe =   11.91(In.)
Flow top width inside pipe =   12.14(In.)
Critical depth could not be calculated.
Pipe flow velocity =     14.43(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    11.20 min.


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Process from Point/Station      109.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     20.210(Ac.)
Runoff from this stream =     15.074(CFS)
Time of concentration =   11.20 min.
Rainfall intensity =     1.339(In/Hr)


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Process from Point/Station      113.000 to Point/Station      114.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   965.000(Ft.)
Top (of initial area) elevation =  1567.900(Ft.)
Bottom (of initial area) elevation =  1556.000(Ft.)
Difference in elevation =    11.900(Ft.)
Slope =    0.01233  s(percent)=       1.23
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.678 min.
Rainfall intensity =      1.160(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.650
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.400
RI index for soil(AMC 1)  =  48.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.135(CFS)
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Total initial stream area =        2.830(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      114.000 to Point/Station      115.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1556.000(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   610.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.847(CFS)
Depth of flow =   0.267(Ft.), Average velocity =   4.581(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   7.035(Ft.)
Flow velocity =   4.58(Ft/s)
Travel time =    2.22 min.     TC =   16.90  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.615
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  41.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.077(In/Hr) for a     2.0 year storm
Subarea runoff =      1.330(CFS) for      2.010(Ac.)
Total runoff =      3.465(CFS)   Total area =       4.840(Ac.)
Street flow at end of street =      3.465(CFS)
Half street flow at end of street =      3.465(CFS)
Depth of flow =   0.282(Ft.), Average velocity =   4.772(Ft/s)
Flow width (from curb towards crown)=   7.743(Ft.)


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Process from Point/Station      115.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1521.200(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.465(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.465(CFS)
Normal flow depth in pipe =    8.44(In.)
Flow top width inside pipe =   10.97(In.)
Critical Depth =    9.55(In.)
Pipe flow velocity =      5.87(Ft/s)
Travel time through pipe =    0.09 min.
```

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Time of concentration (TC) =    16.98 min.


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Process from Point/Station      115.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.840(Ac.)
Runoff from this stream =      3.465(CFS)
Time of concentration =   16.98 min.
Rainfall intensity =     1.074(In/Hr)


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Process from Point/Station      104.000 to Point/Station      127.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   623.000(Ft.)
Top (of initial area) elevation =  1572.000(Ft.)
Bottom (of initial area) elevation =  1552.000(Ft.)
Difference in elevation =    20.000(Ft.)
Slope =    0.03210  s(percent)=       3.21
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.175 min.
Rainfall intensity =      1.409(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.618
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.549(CFS)
Total initial stream area =       1.780(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      127.000 to Point/Station      128.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1552.000(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   518.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.352(CFS)
Depth of flow =   0.254(Ft.), Average velocity =   4.407(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   6.381(Ft.)
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Flow velocity =   4.41(Ft/s)
Travel time =    1.96 min.     TC =   12.13  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.633
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  41.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.283(In/Hr) for a     2.0 year storm
Subarea runoff =      1.552(CFS) for      1.910(Ac.)
Total runoff =      3.101(CFS)   Total area =       3.690(Ac.)
Street flow at end of street =      3.101(CFS)
Half street flow at end of street =      3.101(CFS)
Depth of flow =   0.274(Ft.), Average velocity =   4.658(Ft/s)
Flow width (from curb towards crown)=   7.343(Ft.)


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Process from Point/Station      128.000 to Point/Station      112.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1521.200(Ft.)
Downstream point/station elevation =  1520.800(Ft.)
Pipe length  =    45.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.101(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.101(CFS)
Normal flow depth in pipe =    9.09(In.)
Flow top width inside pipe =   10.28(In.)
Critical Depth =    9.06(In.)
Pipe flow velocity =      4.85(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    12.29 min.


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Process from Point/Station      128.000 to Point/Station      112.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      3.690(Ac.)
Runoff from this stream =      3.101(CFS)
Time of concentration =   12.29 min.
Rainfall intensity =     1.274(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       15.074     11.20                1.339
2        3.465     16.98                1.074
3        3.101     12.29                1.274
Largest stream flow has longer or shorter time of concentration
Qp =     15.074 + sum of
         Qa          Tb/Ta
          3.465 *    0.659 =      2.284
         Qa          Tb/Ta
          3.101 *    0.911 =      2.825
Qp =     20.184
```

```
Total of 3 streams to confluence:
Flow rates before confluence point:
      15.074       3.465       3.101
Area of streams before confluence:
       20.210        4.840        3.690
Results of confluence:
Total flow rate =     20.184(CFS)
Time of concentration =    11.195 min.
Effective stream area after confluence =     28.740(Ac.)


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Process from Point/Station      112.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1520.800(Ft.)
Downstream point/station elevation =  1520.000(Ft.)
Pipe length  =    32.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.184(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    20.184(CFS)
Normal flow depth in pipe =   14.27(In.)
Flow top width inside pipe =   19.60(In.)
Critical Depth =   19.24(In.)
Pipe flow velocity =     11.59(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    11.24 min.


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Process from Point/Station      112.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     28.740(Ac.)
Runoff from this stream =     20.184(CFS)
Time of concentration =   11.24 min.
Rainfall intensity =     1.336(In/Hr)


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Process from Point/Station      117.000 to Point/Station      118.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   500.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1539.300(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.00900  s(percent)=       0.90
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.017 min.
Rainfall intensity =      1.290(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.651
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.748(CFS)
Total initial stream area =        0.890(Ac.)
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Pervious area fraction = 0.500


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Process from Point/Station      118.000 to Point/Station      119.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1539.300(Ft.)
End of street segment elevation =  1529.800(Ft.)
Length of street segment  =   933.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      1.339(CFS)
Depth of flow =   0.265(Ft.), Average velocity =   2.215(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   6.914(Ft.)
Flow velocity =   2.21(Ft/s)
Travel time =    7.02 min.     TC =   19.04  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.645
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.700
RI index for soil(AMC 1)  =  50.16
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.011(In/Hr) for a     2.0 year storm
Subarea runoff =      1.101(CFS) for      1.690(Ac.)
Total runoff =      1.849(CFS)   Total area =       2.580(Ac.)
Street flow at end of street =      1.849(CFS)
Half street flow at end of street =      1.849(CFS)
Depth of flow =   0.288(Ft.), Average velocity =   2.369(Ft/s)
Flow width (from curb towards crown)=   8.085(Ft.)


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Process from Point/Station      119.000 to Point/Station      116.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1521.400(Ft.)
Downstream point/station elevation =  1520.000(Ft.)
Pipe length  =    57.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.849(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.849(CFS)
Normal flow depth in pipe =    5.62(In.)
Flow top width inside pipe =    8.72(In.)
Critical Depth =    7.46(In.)
Pipe flow velocity =      6.38(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    19.19 min.
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Process from Point/Station      119.000 to Point/Station      116.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.580(Ac.)
Runoff from this stream =      1.849(CFS)
Time of concentration =   19.19 min.
Rainfall intensity =     1.006(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       20.184     11.24                 1.336
2        1.849     19.19                 1.006
Largest stream flow has longer or shorter time of concentration
Qp =     20.184 + sum of
         Qa          Tb/Ta
          1.849 *    0.586 =      1.083
Qp =     21.267

Total of 2 streams to confluence:
Flow rates before confluence point:
      20.184       1.849
Area of streams before confluence:
       28.740        2.580
Results of confluence:
Total flow rate =     21.267(CFS)
Time of concentration =    11.241 min.
Effective stream area after confluence =     31.320(Ac.)


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Process from Point/Station      116.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1520.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    21.267(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    21.267(CFS)
Normal flow depth in pipe =   19.17(In.)
Flow top width inside pipe =   19.24(In.)
Critical Depth =   19.82(In.)
Pipe flow velocity =      7.90(Ft/s)
Travel time through pipe =    0.11 min.
Time of concentration (TC) =    11.36 min.


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Process from Point/Station      116.000 to Point/Station      120.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     31.320(Ac.)
Runoff from this stream =     21.267(CFS)
Time of concentration =   11.36 min.
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Rainfall intensity =     1.329(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      121.000 to Point/Station      122.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   193.000(Ft.)
Top (of initial area) elevation =  1546.000(Ft.)
Bottom (of initial area) elevation =  1544.700(Ft.)
Difference in elevation =     1.300(Ft.)
Slope =    0.00674  s(percent)=       0.67
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.702 min.
Rainfall intensity =      1.530(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.722
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.071(CFS)
Total initial stream area =        0.970(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      122.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1537.700(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =   496.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.071(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.071(CFS)
Normal flow depth in pipe =    4.96(In.)
Flow top width inside pipe =    8.95(In.)
Critical Depth =    5.70(In.)
Pipe flow velocity =      4.28(Ft/s)
Travel time through pipe =    1.93 min.
Time of concentration (TC) =    10.63 min.


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Process from Point/Station      122.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.970(Ac.)
Runoff from this stream =      1.071(CFS)
Time of concentration =   10.63 min.
Rainfall intensity =     1.376(In/Hr)


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Process from Point/Station      124.000 to Point/Station      125.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   960.000(Ft.)
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Top (of initial area) elevation =  1549.500(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =    10.500(Ft.)
Slope =    0.01094  s(percent)=       1.09
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.003 min.
Rainfall intensity =      1.147(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.649
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.600
RI index for soil(AMC 1)  =  47.88
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.413(CFS)
Total initial stream area =        4.590(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      125.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =    26.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.413(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.413(CFS)
Normal flow depth in pipe =    8.84(In.)
Flow top width inside pipe =   10.57(In.)
Critical Depth =    9.48(In.)
Pipe flow velocity =      5.51(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    15.08 min.


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Process from Point/Station      125.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      4.590(Ac.)
Runoff from this stream =      3.413(CFS)
Time of concentration =   15.08 min.
Rainfall intensity =     1.143(In/Hr)


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Process from Point/Station      124.000 to Point/Station      126.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1549.500(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =    10.500(Ft.)
Slope =    0.01050  s(percent)=       1.05
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.375 min.
Rainfall intensity =      1.132(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.657
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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.700
RI index for soil(AMC 1)  =  50.16
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.720(CFS)
Total initial stream area =        5.000(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      126.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.700(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.720(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.720(CFS)
Normal flow depth in pipe =    8.52(In.)
Flow top width inside pipe =   10.89(In.)
Critical Depth =    9.85(In.)
Pipe flow velocity =      6.24(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    15.43 min.


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Process from Point/Station      126.000 to Point/Station      123.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      5.000(Ac.)
Runoff from this stream =      3.720(CFS)
Time of concentration =   15.43 min.
Rainfall intensity =     1.130(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        1.071     10.63                1.376
2        3.413     15.08                1.143
3        3.720     15.43                1.130
Largest stream flow has longer time of concentration
Qp =      3.720 + sum of
        Qb         Ia/Ib
         1.071 *    0.821 =      0.879
        Qb         Ia/Ib
         3.413 *    0.988 =      3.373
Qp =      7.971

Total of 3 streams to confluence:
Flow rates before confluence point:
       1.071       3.413       3.720
Area of streams before confluence:
        0.970        4.590        5.000
Results of confluence:
Total flow rate =      7.971(CFS)
Time of concentration =    15.429 min.
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Effective stream area after confluence =     10.560(Ac.)


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Process from Point/Station      123.000 to Point/Station      120.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1531.700(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =   800.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.971(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     7.971(CFS)
Normal flow depth in pipe =   15.00(In.)
Flow top width inside pipe =    0.00(In.)
Critical Depth =   13.37(In.)
Pipe flow velocity =      6.50(Ft/s)
Travel time through pipe =    2.05 min.
Time of concentration (TC) =    17.48 min.


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Process from Point/Station      123.000 to Point/Station      120.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     10.560(Ac.)
Runoff from this stream =      7.971(CFS)
Time of concentration =   17.48 min.
Rainfall intensity =     1.057(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       21.267     11.36           1.329
2        7.971     17.48           1.057
Largest stream flow has longer or shorter time of concentration
Qp =     21.267 + sum of
         Qa          Tb/Ta
          7.971 *    0.650 =      5.178
Qp =     26.445

Total of 2 main streams to confluence:
Flow rates before confluence point:
      21.267       7.971
Area of streams before confluence:
       31.320       10.560


Results of confluence:
Total flow rate =     26.445(CFS)
Time of concentration =    11.355 min.
Effective stream area after confluence  =     41.880(Ac.)


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Process from Point/Station      120.000 to Point/Station      128.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1519.500(Ft.)
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Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =  1360.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    26.445(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    26.445(CFS)
Normal flow depth in pipe =   21.47(In.)
Flow top width inside pipe =   21.79(In.)
Critical Depth =   21.54(In.)
Pipe flow velocity =      7.80(Ft/s)
Travel time through pipe =    2.91 min.
Time of concentration (TC) =    14.26 min.


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Process from Point/Station      120.000 to Point/Station      128.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     41.880(Ac.)
Runoff from this stream =     26.445(CFS)
Time of concentration =   14.26 min.
Rainfall intensity =     1.178(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      158.000 to Point/Station      159.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   245.000(Ft.)
Top (of initial area) elevation =  1720.000(Ft.)
Bottom (of initial area) elevation =  1659.000(Ft.)
Difference in elevation =    61.000(Ft.)
Slope =    0.24898  s(percent)=      24.90
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.320 min.
Rainfall intensity =      1.813(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.609
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      1.225(CFS)
Total initial stream area =        1.110(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      158.000 to Point/Station      159.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
```

```
Time of concentration =     6.32 min.
Rainfall intensity =      1.813(In/Hr) for a     2.0 year storm
Subarea runoff =      0.631(CFS) for      0.410(Ac.)
Total runoff =      1.856(CFS)   Total area =       1.520(Ac.)


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Process from Point/Station      158.000 to Point/Station      159.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     6.32 min.
Rainfall intensity =      1.813(In/Hr) for a     2.0 year storm
Subarea runoff =      1.093(CFS) for      0.710(Ac.)
Total runoff =      2.949(CFS)   Total area =       2.230(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      160.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1650.000(Ft.)
Downstream point/station elevation =  1512.000(Ft.)
Pipe length  =   965.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.949(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.949(CFS)
Normal flow depth in pipe =    4.35(In.)
Flow top width inside pipe =    8.99(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.95(Ft/s)
Travel time through pipe =    1.15 min.
Time of concentration (TC) =     7.47 min.


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Process from Point/Station      160.000 to Point/Station      161.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      2.230(Ac.)
Runoff from this stream =      2.949(CFS)
Time of concentration =    7.47 min.
Rainfall intensity =     1.659(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      162.000 to Point/Station      163.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   945.000(Ft.)
Top (of initial area) elevation =  1717.700(Ft.)
Bottom (of initial area) elevation =  1520.000(Ft.)
Difference in elevation =   197.700(Ft.)
Slope =    0.20921  s(percent)=      20.92
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
```

```
Initial area time of concentration =   11.229 min.
Rainfall intensity =      1.337(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.573
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  63.56
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.552(CFS)
Total initial stream area =        4.640(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      163.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1513.000(Ft.)
Downstream point/station elevation =  1512.000(Ft.)
Pipe length  =    23.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.552(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.552(CFS)
Normal flow depth in pipe =    5.85(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =    9.66(In.)
Pipe flow velocity =      9.35(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    11.27 min.


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Process from Point/Station      163.000 to Point/Station      161.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      4.640(Ac.)
Runoff from this stream =      3.552(CFS)
Time of concentration =   11.27 min.
Rainfall intensity =     1.334(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        2.949      7.47                 1.659
2        3.552     11.27                 1.334
Largest stream flow has longer time of concentration
Qp =      3.552 + sum of
         Qb         Ia/Ib
          2.949 *    0.804 =      2.372
Qp =      5.924

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.949       3.552
Area of streams before confluence:
        2.230        4.640
Results of confluence:
Total flow rate =      5.924(CFS)
```

```
Time of concentration =    11.270 min.
Effective stream area after confluence =      6.870(Ac.)


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Process from Point/Station      163.000 to Point/Station      161.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.556
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  61.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    11.27 min.
Rainfall intensity =      1.334(In/Hr) for a     2.0 year storm
Subarea runoff =      0.445(CFS) for      0.600(Ac.)
Total runoff =      6.370(CFS)   Total area =       7.470(Ac.)


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Process from Point/Station      161.000 to Point/Station      128.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1512.000(Ft.)
Downstream point/station elevation =  1509.000(Ft.)
Pipe length  =   567.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.370(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     6.370(CFS)
Normal flow depth in pipe =   12.56(In.)
Flow top width inside pipe =   16.53(In.)
Critical Depth =   11.71(In.)
Pipe flow velocity =      4.84(Ft/s)
Travel time through pipe =    1.95 min.
Time of concentration (TC) =    13.22 min.


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Process from Point/Station      161.000 to Point/Station      128.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      7.470(Ac.)
Runoff from this stream =      6.370(CFS)
Time of concentration =   13.22 min.
Rainfall intensity =     1.226(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       26.445     14.26           1.178
2        6.370     13.22           1.226
Largest stream flow has longer time of concentration
Qp =     26.445 + sum of
         Qb         Ia/Ib
          6.370 *    0.961 =      6.119
Qp =     32.565
```

```
Total of 2 main streams to confluence:
Flow rates before confluence point:
      26.445       6.370
Area of streams before confluence:
       41.880        7.470


Results of confluence:
Total flow rate =     32.565(CFS)
Time of concentration =    14.262 min.
Effective stream area after confluence  =     49.350(Ac.)


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Process from Point/Station      128.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1509.000(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =   333.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    32.565(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    32.565(CFS)
Normal flow depth in pipe =   16.76(In.)
Flow top width inside pipe =   22.03(In.)
Critical Depth =   22.74(In.)
Pipe flow velocity =     13.90(Ft/s)
Travel time through pipe =    0.40 min.
Time of concentration (TC) =    14.66 min.


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Process from Point/Station      128.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     49.350(Ac.)
Runoff from this stream =     32.565(CFS)
Time of concentration =   14.66 min.
Rainfall intensity =     1.161(In/Hr)


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Process from Point/Station      130.000 to Point/Station      131.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   994.000(Ft.)
Top (of initial area) elevation =  1521.000(Ft.)
Bottom (of initial area) elevation =  1508.600(Ft.)
Difference in elevation =    12.400(Ft.)
Slope =    0.01247  s(percent)=       1.25
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.819 min.
Rainfall intensity =      1.154(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.622
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  41.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
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Initial subarea runoff =      1.680(CFS)
Total initial stream area =        2.340(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      131.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1499.400(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =    22.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.680(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.680(CFS)
Normal flow depth in pipe =    6.49(In.)
Flow top width inside pipe =    8.07(In.)
Critical Depth =    7.14(In.)
Pipe flow velocity =      4.93(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    14.89 min.


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Process from Point/Station      131.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.340(Ac.)
Runoff from this stream =      1.680(CFS)
Time of concentration =   14.89 min.
Rainfall intensity =     1.151(In/Hr)


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Process from Point/Station      132.000 to Point/Station      133.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   636.000(Ft.)
Top (of initial area) elevation =  1526.500(Ft.)
Bottom (of initial area) elevation =  1519.100(Ft.)
Difference in elevation =     7.400(Ft.)
Slope =    0.01164  s(percent)=       1.16
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.569 min.
Rainfall intensity =      1.259(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.700
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.199(CFS)
Total initial stream area =        1.360(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      133.000 to Point/Station      134.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
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```
Top of street segment elevation =  1519.100(Ft.)
End of street segment elevation =  1510.100(Ft.)
Length of street segment  =   806.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      3.498(CFS)
Depth of flow =   0.337(Ft.), Average velocity =   2.833(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  10.527(Ft.)
Flow velocity =   2.83(Ft/s)
Travel time =    4.74 min.     TC =   17.31  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.630
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.063(In/Hr) for a     2.0 year storm
Subarea runoff =      4.501(CFS) for      6.720(Ac.)
Total runoff =      5.701(CFS)   Total area =       8.080(Ac.)
Street flow at end of street =      5.701(CFS)
Half street flow at end of street =      5.701(CFS)
Depth of flow =   0.385(Ft.), Average velocity =   3.176(Ft/s)
Flow width (from curb towards crown)=  12.915(Ft.)


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Process from Point/Station      134.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1499.400(Ft.)
Downstream point/station elevation =  1499.100(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.701(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.701(CFS)
Normal flow depth in pipe =   10.20(In.)
Flow top width inside pipe =   14.00(In.)
Critical Depth =   11.60(In.)
Pipe flow velocity =      6.41(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    17.38 min.


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Process from Point/Station      134.000 to Point/Station      129.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
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```
Stream flow area =      8.080(Ac.)
Runoff from this stream =      5.701(CFS)
Time of concentration =   17.38 min.
Rainfall intensity =     1.061(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       32.565     14.66                1.161
2        1.680     14.89                1.151
3        5.701     17.38                1.061
Largest stream flow has longer or shorter time of concentration
Qp =     32.565 + sum of
         Qa          Tb/Ta
          1.680 *    0.984 =      1.654
         Qa          Tb/Ta
          5.701 *    0.844 =      4.810
Qp =     39.029

Total of 3 streams to confluence:
Flow rates before confluence point:
      32.565       1.680       5.701
Area of streams before confluence:
       49.350        2.340        8.080
Results of confluence:
Total flow rate =     39.029(CFS)
Time of concentration =    14.661 min.
Effective stream area after confluence =     59.770(Ac.)


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Process from Point/Station      129.000 to Point/Station      135.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1499.100(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =   107.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    39.029(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    39.029(CFS)
Normal flow depth in pipe =   23.06(In.)
Flow top width inside pipe =   25.30(In.)
Critical Depth =   25.29(In.)
Pipe flow velocity =      9.63(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    14.85 min.


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Process from Point/Station      129.000 to Point/Station      135.100
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     59.770(Ac.)
Runoff from this stream =     39.029(CFS)
Time of concentration =   14.85 min.
Rainfall intensity =     1.153(In/Hr)
Program is now starting with Main Stream No. 2
```

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Process from Point/Station      136.000 to Point/Station      137.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------------
Initial area flow distance =   616.000(Ft.)
Top (of initial area) elevation =  1515.100(Ft.)
Bottom (of initial area) elevation =  1506.700(Ft.)
Difference in elevation =     8.400(Ft.)
Slope =    0.01364  s(percent)=       1.36
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.021 min.
Rainfall intensity =      1.289(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.521
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  16.20
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.202(CFS)
Total initial stream area =        1.790(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      137.000 to Point/Station      138.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1498.900(Ft.)
Downstream point/station elevation =  1498.400(Ft.)
Pipe length  =    47.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.202(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.202(CFS)
Normal flow depth in pipe =    5.57(In.)
Flow top width inside pipe =    8.74(In.)
Critical Depth =    6.05(In.)
Pipe flow velocity =      4.18(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    12.21 min.


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Process from Point/Station      137.000 to Point/Station      138.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      1.790(Ac.)
Runoff from this stream =      1.202(CFS)
Time of concentration =   12.21 min.
Rainfall intensity =     1.279(In/Hr)


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Process from Point/Station      139.000 to Point/Station      140.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------------
Initial area flow distance =   701.000(Ft.)
Top (of initial area) elevation =  1512.200(Ft.)
Bottom (of initial area) elevation =  1506.700(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.00785  s(percent)=       0.78
```

```
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.139 min.
Rainfall intensity =      1.183(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.600
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.675(CFS)
Total initial stream area =        2.360(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      140.000 to Point/Station      138.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1498.600(Ft.)
Downstream point/station elevation =  1498.400(Ft.)
Pipe length  =    10.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.675(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.675(CFS)
Normal flow depth in pipe =    5.63(In.)
Flow top width inside pipe =    8.71(In.)
Critical Depth =    7.14(In.)
Pipe flow velocity =      5.76(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =    14.17 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      140.000 to Point/Station      138.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      2.360(Ac.)
Runoff from this stream =      1.675(CFS)
Time of concentration =   14.17 min.
Rainfall intensity =     1.182(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        1.202     12.21                1.279
2        1.675     14.17                1.182
Largest stream flow has longer time of concentration
Qp =      1.675 + sum of
         Qb         Ia/Ib
          1.202 *    0.924 =      1.111
Qp =      2.786

Total of 2 streams to confluence:
Flow rates before confluence point:
       1.202       1.675
Area of streams before confluence:
        1.790        2.360
Results of confluence:
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```
Total flow rate =      2.786(CFS)
Time of concentration =    14.168 min.
Effective stream area after confluence =      4.150(Ac.)


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Process from Point/Station      138.000 to Point/Station      135.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1498.400(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.786(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.786(CFS)
Normal flow depth in pipe =    7.98(In.)
Flow top width inside pipe =   11.33(In.)
Critical Depth =    8.59(In.)
Pipe flow velocity =      5.02(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =    14.30 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      138.000 to Point/Station      135.200
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      4.150(Ac.)
Runoff from this stream =      2.786(CFS)
Time of concentration =   14.30 min.
Rainfall intensity =     1.176(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      146.000 to Point/Station      147.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1744.000(Ft.)
Bottom (of initial area) elevation =  1579.000(Ft.)
Difference in elevation =   165.000(Ft.)
Slope =    0.16500  s(percent)=      16.50
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.044 min.
Rainfall intensity =      1.288(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.538
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      2.959(CFS)
Total initial stream area =        4.270(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      147.000 to Point/Station      148.000
```

```
**** IMPROVED CHANNEL TRAVEL TIME ****
____________________________________________________________________________
Upstream point elevation =  1579.000(Ft.)
Downstream point elevation =  1568.000(Ft.)
Channel length thru subarea  =   185.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      3.196(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      3.196(CFS)
Depth of flow =   0.576(Ft.), Average velocity =   9.644(Ft/s)
Channel flow top width =    1.151(Ft.)
Flow Velocity =    9.64(Ft/s)
Travel time  =    0.32 min.
Time of concentration =   12.36 min.

Sub-Channel No. 1 Critical depth =      0.914(Ft.)
  '     '       '     Critical flow top width =      1.828(Ft.)
  '     '       '     Critical flow velocity=    3.826(Ft/s)
  '     '       '     Critical flow area =      0.836(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.437
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.270(In/Hr) for a     2.0 year storm
Subarea runoff =      0.422(CFS) for      0.760(Ac.)
Total runoff =      3.381(CFS)   Total area =       5.030(Ac.)
Depth of flow =   0.588(Ft.), Average velocity =   9.781(Ft/s)

Sub-Channel No. 1 Critical depth =      0.938(Ft.)
  '     '       '     Critical flow top width =      1.875(Ft.)
  '     '       '     Critical flow velocity=    3.847(Ft/s)
  '     '       '     Critical flow area =      0.879(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      147.000 to Point/Station      148.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.535
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    12.36 min.
Rainfall intensity =      1.270(In/Hr) for a     2.0 year storm
Subarea runoff =      1.631(CFS) for      2.400(Ac.)
Total runoff =      5.012(CFS)   Total area =       7.430(Ac.)


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Process from Point/Station      148.000 to Point/Station      149.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =  1568.000(Ft.)
Downstream point elevation =  1560.000(Ft.)
Channel length thru subarea  =   220.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      5.147(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      5.147(CFS)
Depth of flow =   0.755(Ft.), Average velocity =   9.035(Ft/s)
Channel flow top width =    1.510(Ft.)
Flow Velocity =    9.04(Ft/s)
Travel time  =    0.41 min.
Time of concentration =   12.77 min.

Sub-Channel No. 1 Critical depth =      1.102(Ft.)
  '     '       '     Critical flow top width =      2.203(Ft.)
  '     '       '     Critical flow velocity=    4.242(Ft/s)
  '     '       '     Critical flow area =      1.213(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.433
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.249(In/Hr) for a     2.0 year storm
Subarea runoff =      0.217(CFS) for      0.400(Ac.)
Total runoff =      5.229(CFS)   Total area =       7.830(Ac.)
Depth of flow =   0.759(Ft.), Average velocity =   9.071(Ft/s)

Sub-Channel No. 1 Critical depth =      1.109(Ft.)
  '     '       '     Critical flow top width =      2.219(Ft.)
  '     '       '     Critical flow velocity=    4.249(Ft/s)
  '     '       '     Critical flow area =      1.231(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      149.000 to Point/Station      150.000
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =  1560.000(Ft.)
Downstream point elevation =  1555.000(Ft.)
Channel length thru subarea  =   190.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      5.531(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      5.531(CFS)
Depth of flow =   0.824(Ft.), Average velocity =   8.148(Ft/s)
Channel flow top width =    1.648(Ft.)
Flow Velocity =    8.15(Ft/s)
Travel time  =    0.39 min.
```

```
Time of concentration =   13.16 min.

Sub-Channel No. 1 Critical depth =      1.141(Ft.)
  '     '       '     Critical flow top width =      2.281(Ft.)
  '     '       '     Critical flow velocity=    4.251(Ft/s)
  '     '       '     Critical flow area =      1.301(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.430
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.229(In/Hr) for a     2.0 year storm
Subarea runoff =      0.534(CFS) for      1.010(Ac.)
Total runoff =      5.763(CFS)   Total area =       8.840(Ac.)
Depth of flow =   0.837(Ft.), Average velocity =   8.232(Ft/s)

Sub-Channel No. 1 Critical depth =      1.156(Ft.)
  '     '       '     Critical flow top width =      2.313(Ft.)
  '     '       '     Critical flow velocity=    4.310(Ft/s)
  '     '       '     Critical flow area =      1.337(Sq.Ft)



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Process from Point/Station      149.000 to Point/Station      150.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.528
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  60.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    13.16 min.
Rainfall intensity =      1.229(In/Hr) for a     2.0 year storm
Subarea runoff =      2.206(CFS) for      3.400(Ac.)
Total runoff =      7.968(CFS)   Total area =      12.240(Ac.)


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Process from Point/Station      150.000 to Point/Station      151.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =  1555.000(Ft.)
Downstream point elevation =  1536.000(Ft.)
Channel length thru subarea  =   330.000(Ft.)
Channel base width  =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      8.131(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      8.131(CFS)
Depth of flow =   0.822(Ft.), Average velocity =  12.034(Ft/s)
Channel flow top width =    1.644(Ft.)
Flow Velocity =   12.03(Ft/s)
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Travel time  =    0.46 min.
Time of concentration =   13.62 min.

Sub-Channel No. 1 Critical depth =      1.328(Ft.)
  '     '       '     Critical flow top width =      2.656(Ft.)
  '     '       '     Critical flow velocity=    4.610(Ft/s)
  '     '       '     Critical flow area =      1.764(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.426
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.207(In/Hr) for a     2.0 year storm
Subarea runoff =      0.257(CFS) for      0.500(Ac.)
Total runoff =      8.225(CFS)   Total area =      12.740(Ac.)
Depth of flow =   0.826(Ft.), Average velocity =  12.069(Ft/s)

Sub-Channel No. 1 Critical depth =      1.328(Ft.)
  '     '       '     Critical flow top width =      2.656(Ft.)
  '     '       '     Critical flow velocity=    4.663(Ft/s)
  '     '       '     Critical flow area =      1.764(Sq.Ft)



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Process from Point/Station      151.000 to Point/Station      152.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1534.000(Ft.)
Downstream point/station elevation =  1533.000(Ft.)
Pipe length  =   104.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.225(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     8.225(CFS)
Normal flow depth in pipe =   12.16(In.)
Flow top width inside pipe =   16.85(In.)
Critical Depth =   13.33(In.)
Pipe flow velocity =      6.47(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    13.88 min.


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Process from Point/Station      151.000 to Point/Station      152.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     12.740(Ac.)
Runoff from this stream =      8.225(CFS)
Time of concentration =   13.88 min.
Rainfall intensity =     1.195(In/Hr)


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Process from Point/Station      153.000 to Point/Station      152.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   727.000(Ft.)
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Top (of initial area) elevation =  1707.000(Ft.)
Bottom (of initial area) elevation =  1537.000(Ft.)
Difference in elevation =   170.000(Ft.)
Slope =    0.23384  s(percent)=      23.38
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.888 min.
Rainfall intensity =      1.430(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.625
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  67.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      3.037(CFS)
Total initial stream area =        3.400(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      153.000 to Point/Station      152.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      3.400(Ac.)
Runoff from this stream =      3.037(CFS)
Time of concentration =    9.89 min.
Rainfall intensity =     1.430(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        8.225     13.88                1.195
2        3.037      9.89                1.430
Largest stream flow has longer time of concentration
Qp =      8.225 + sum of
         Qb         Ia/Ib
          3.037 *    0.835 =      2.537
Qp =     10.763

Total of 2 streams to confluence:
Flow rates before confluence point:
       8.225       3.037
Area of streams before confluence:
       12.740        3.400
Results of confluence:
Total flow rate =     10.763(CFS)
Time of concentration =    13.883 min.
Effective stream area after confluence =     16.140(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      152.000 to Point/Station      154.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =   440.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.763(CFS)
Nearest computed pipe diameter  =     15.00(In.)
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Calculated individual pipe flow  =    10.763(CFS)
Normal flow depth in pipe =   11.70(In.)
Flow top width inside pipe =   12.43(In.)
Critical depth could not be calculated.
Pipe flow velocity =     10.49(Ft/s)
Travel time through pipe =    0.70 min.
Time of concentration (TC) =    14.58 min.


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Process from Point/Station      152.000 to Point/Station      154.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     16.140(Ac.)
Runoff from this stream =     10.763(CFS)
Time of concentration =   14.58 min.
Rainfall intensity =     1.164(In/Hr)


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Process from Point/Station      155.000 to Point/Station      156.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   320.000(Ft.)
Top (of initial area) elevation =  1575.000(Ft.)
Bottom (of initial area) elevation =  1528.000(Ft.)
Difference in elevation =    47.000(Ft.)
Slope =    0.14688  s(percent)=      14.69
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.470 min.
Rainfall intensity =      1.387(In/Hr) for a     2.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.625
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  68.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.477(CFS)
Total initial stream area =        0.550(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      156.000 to Point/Station      154.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1528.000(Ft.)
Downstream point/station elevation =  1519.500(Ft.)
Pipe length  =    36.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.477(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.477(CFS)
Normal flow depth in pipe =    1.70(In.)
Flow top width inside pipe =    5.41(In.)
Critical Depth =    4.22(In.)
Pipe flow velocity =     10.44(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    10.53 min.
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Process from Point/Station      156.000 to Point/Station      154.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      0.550(Ac.)
Runoff from this stream =      0.477(CFS)
Time of concentration =   10.53 min.
Rainfall intensity =     1.383(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)               (In/Hr)


1       10.763     14.58                1.164
2        0.477     10.53                1.383
Largest stream flow has longer time of concentration
Qp =     10.763 + sum of
         Qb         Ia/Ib
          0.477 *    0.841 =      0.401
Qp =     11.164

Total of 2 streams to confluence:
Flow rates before confluence point:
      10.763       0.477
Area of streams before confluence:
       16.140        0.550
Results of confluence:
Total flow rate =     11.164(CFS)
Time of concentration =    14.582 min.
Effective stream area after confluence =     16.690(Ac.)


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Process from Point/Station      154.000 to Point/Station      157.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1519.500(Ft.)
Downstream point/station elevation =  1509.800(Ft.)
Pipe length  =   660.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.164(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.164(CFS)
Normal flow depth in pipe =   13.05(In.)
Flow top width inside pipe =   16.07(In.)
Critical Depth =   15.34(In.)
Pipe flow velocity =      8.13(Ft/s)
Travel time through pipe =    1.35 min.
Time of concentration (TC) =    15.94 min.


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Process from Point/Station      154.000 to Point/Station      157.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     16.690(Ac.)
Runoff from this stream =     11.164(CFS)
Time of concentration =   15.94 min.
Rainfall intensity =     1.111(In/Hr)
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Process from Point/Station      158.000 to Point/Station      159.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   442.000(Ft.)
Top (of initial area) elevation =  1640.000(Ft.)
Bottom (of initial area) elevation =  1535.000(Ft.)
Difference in elevation =   105.000(Ft.)
Slope =    0.23756  s(percent)=      23.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.078 min.
Rainfall intensity =      1.592(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.676
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  71.60
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      2.205(CFS)
Total initial stream area =        2.050(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      159.000 to Point/Station      157.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1509.800(Ft.)
Pipe length  =    65.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.205(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     2.205(CFS)
Normal flow depth in pipe =    3.55(In.)
Flow top width inside pipe =    5.90(In.)
Critical depth could not be calculated.
Pipe flow velocity =     18.22(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =     8.14 min.


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Process from Point/Station      159.000 to Point/Station      157.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      2.050(Ac.)
Runoff from this stream =      2.205(CFS)
Time of concentration =    8.14 min.
Rainfall intensity =     1.586(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       11.164     15.94                1.111
2        2.205      8.14                1.586
Largest stream flow has longer time of concentration
Qp =     11.164 + sum of
         Qb         Ia/Ib
```

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          2.205 *    0.700 =      1.544
Qp =     12.708

Total of 2 streams to confluence:
Flow rates before confluence point:
      11.164       2.205
Area of streams before confluence:
       16.690        2.050
Results of confluence:
Total flow rate =     12.708(CFS)
Time of concentration =    15.936 min.
Effective stream area after confluence =     18.740(Ac.)


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Process from Point/Station      157.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1509.800(Ft.)
Downstream point/station elevation =  1503.800(Ft.)
Pipe length  =   307.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.708(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    12.708(CFS)
Normal flow depth in pipe =   12.94(In.)
Flow top width inside pipe =   16.19(In.)
Critical Depth =   16.10(In.)
Pipe flow velocity =      9.35(Ft/s)
Travel time through pipe =    0.55 min.
Time of concentration (TC) =    16.48 min.


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Process from Point/Station      157.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =     18.740(Ac.)
Runoff from this stream =     12.708(CFS)
Time of concentration =   16.48 min.
Rainfall intensity =     1.091(In/Hr)


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Process from Point/Station      161.000 to Point/Station      162.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   570.000(Ft.)
Top (of initial area) elevation =  1630.000(Ft.)
Bottom (of initial area) elevation =  1535.000(Ft.)
Difference in elevation =    95.000(Ft.)
Slope =    0.16667  s(percent)=      16.67
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.600 min.
Rainfall intensity =      1.453(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.628
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  67.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
```

```
Initial subarea runoff =      1.514(CFS)
Total initial stream area =        1.660(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      162.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.000(Ft.)
Downstream point/station elevation =  1503.800(Ft.)
Pipe length  =    72.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.514(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     1.514(CFS)
Normal flow depth in pipe =    2.73(In.)
Flow top width inside pipe =    5.97(In.)
Critical depth could not be calculated.
Pipe flow velocity =     17.45(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.67 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      162.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      1.660(Ac.)
Runoff from this stream =      1.514(CFS)
Time of concentration =    9.67 min.
Rainfall intensity =     1.447(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       12.708     16.48                1.091
2        1.514      9.67                1.447
Largest stream flow has longer time of concentration
Qp =     12.708 + sum of
         Qb         Ia/Ib
          1.514 *    0.754 =      1.141
Qp =     13.849

Total of 2 streams to confluence:
Flow rates before confluence point:
      12.708       1.514
Area of streams before confluence:
       18.740        1.660
Results of confluence:
Total flow rate =     13.849(CFS)
Time of concentration =    16.483 min.
Effective stream area after confluence =     20.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      160.000 to Point/Station      135.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1503.800(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
```

```
Pipe length  =   256.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.849(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    13.849(CFS)
Normal flow depth in pipe =   13.05(In.)
Flow top width inside pipe =   16.07(In.)
Critical Depth =   16.52(In.)
Pipe flow velocity =     10.09(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    16.91 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      160.000 to Point/Station      135.200
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =     20.400(Ac.)
Runoff from this stream =     13.849(CFS)
Time of concentration =   16.91 min.
Rainfall intensity =     1.076(In/Hr)
Program is now starting with Main Stream No. 4


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      128.000 to Point/Station      140.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   580.000(Ft.)
Top (of initial area) elevation =  1529.800(Ft.)
Bottom (of initial area) elevation =  1523.300(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.01121  s(percent)=       1.12
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.205 min.
Rainfall intensity =      1.279(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.702
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.167(CFS)
Total initial stream area =        1.300(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      140.000 to Point/Station      141.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1523.300(Ft.)
End of street segment elevation =  1504.000(Ft.)
Length of street segment  =  1420.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
```

```
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.142(CFS)
Depth of flow =   0.289(Ft.), Average velocity =   2.739(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   8.096(Ft.)
Flow velocity =   2.74(Ft/s)
Travel time =    8.64 min.     TC =   20.85  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.620
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      0.963(In/Hr) for a     2.0 year storm
Subarea runoff =      1.886(CFS) for      3.160(Ac.)
Total runoff =      3.053(CFS)   Total area =       4.460(Ac.)
Street flow at end of street =      3.053(CFS)
Half street flow at end of street =      3.053(CFS)
Depth of flow =   0.317(Ft.), Average velocity =   2.962(Ft/s)
Flow width (from curb towards crown)=   9.508(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      141.000 to Point/Station      142.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1498.800(Ft.)
Downstream point/station elevation =  1498.000(Ft.)
Pipe length  =    70.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.053(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.053(CFS)
Normal flow depth in pipe =    8.13(In.)
Flow top width inside pipe =   11.22(In.)
Critical Depth =    8.99(In.)
Pipe flow velocity =      5.39(Ft/s)
Travel time through pipe =    0.22 min.
Time of concentration (TC) =    21.06 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      141.000 to Point/Station      142.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 4 in normal stream number 1
Stream flow area =      4.460(Ac.)
Runoff from this stream =      3.053(CFS)
Time of concentration =   21.06 min.
Rainfall intensity =     0.958(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      143.000
**** INITIAL AREA EVALUATION ****
```

```
Initial area flow distance =   722.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1537.300(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.00900  s(percent)=       0.90
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.919 min.
Rainfall intensity =      1.193(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.643
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.882(CFS)
Total initial stream area =        1.150(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      143.000 to Point/Station      144.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
Top of street segment elevation =  1537.300(Ft.)
End of street segment elevation =  1528.600(Ft.)
Length of street segment  =   863.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      1.344(CFS)
Depth of flow =   0.266(Ft.), Average velocity =   2.208(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   6.944(Ft.)
Flow velocity =   2.21(Ft/s)
Travel time =    6.52 min.     TC =   20.43  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.661
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.100
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.900
RI index for soil(AMC 1)  =  54.72
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      0.973(In/Hr) for a     2.0 year storm
Subarea runoff =      0.843(CFS) for      1.310(Ac.)
Total runoff =      1.725(CFS)   Total area =       2.460(Ac.)
Street flow at end of street =      1.725(CFS)
Half street flow at end of street =      1.725(CFS)
Depth of flow =   0.284(Ft.), Average velocity =   2.325(Ft/s)
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Flow width (from curb towards crown)=   7.843(Ft.)


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Process from Point/Station      144.000 to Point/Station      145.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
____________________________________________________________________________
Top of street segment elevation =  1528.600(Ft.)
End of street segment elevation =  1498.100(Ft.)
Length of street segment  =  1850.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  38.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  40.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.438(CFS)
Depth of flow =   0.291(Ft.), Average velocity =   3.038(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   8.220(Ft.)
Flow velocity =   3.04(Ft/s)
Travel time =   10.15 min.     TC =   30.58  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.599
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      0.786(In/Hr) for a     2.0 year storm
Subarea runoff =      1.342(CFS) for      2.850(Ac.)
Total runoff =      3.066(CFS)   Total area =       5.310(Ac.)
Street flow at end of street =      3.066(CFS)
Half street flow at end of street =      3.066(CFS)
Depth of flow =   0.309(Ft.), Average velocity =   3.196(Ft/s)
Flow width (from curb towards crown)=   9.126(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      145.000 to Point/Station      142.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =  1498.600(Ft.)
Downstream point/station elevation =  1498.100(Ft.)
Pipe length  =    50.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.066(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.066(CFS)
Normal flow depth in pipe =    8.58(In.)
Flow top width inside pipe =   10.84(In.)
Critical Depth =    9.01(In.)
Pipe flow velocity =      5.10(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    30.75 min.
```

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Process from Point/Station      145.000 to Point/Station      142.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 4 in normal stream number 2
Stream flow area =      5.310(Ac.)
Runoff from this stream =      3.066(CFS)
Time of concentration =   30.75 min.
Rainfall intensity =     0.784(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        3.053     21.06                 0.958
2        3.066     30.75                 0.784
Largest stream flow has longer time of concentration
Qp =      3.066 + sum of
         Qb         Ia/Ib
          3.053 *    0.818 =      2.499
Qp =      5.565

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.053       3.066
Area of streams before confluence:
        4.460        5.310
Results of confluence:
Total flow rate =      5.565(CFS)
Time of concentration =    30.746 min.
Effective stream area after confluence =      9.770(Ac.)


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Process from Point/Station      142.000 to Point/Station      134.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1498.100(Ft.)
Downstream point/station elevation =  1496.000(Ft.)
Pipe length  =   116.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.565(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     5.565(CFS)
Normal flow depth in pipe =    8.72(In.)
Flow top width inside pipe =   14.80(In.)
Critical Depth =   11.47(In.)
Pipe flow velocity =      7.51(Ft/s)
Travel time through pipe =    0.26 min.
Time of concentration (TC) =    31.00 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      142.000 to Point/Station      134.400
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      9.770(Ac.)
Runoff from this stream =      5.565(CFS)
Time of concentration =   31.00 min.
```

```
Rainfall intensity =     0.780(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       39.029     14.85           1.153
2        2.786     14.30           1.176
3       13.849     16.91           1.076
4        5.565     31.00           0.780
Largest stream flow has longer or shorter time of concentration
Qp =     39.029 + sum of
         Qb         Ia/Ib
          2.786 *    0.980 =      2.731
         Qa          Tb/Ta
         13.849 *    0.878 =     12.162
         Qa          Tb/Ta
          5.565 *    0.479 =      2.665
Qp =     56.586

Total of 4 main streams to confluence:
Flow rates before confluence point:
      39.029       2.786      13.849       5.565
Area of streams before confluence:
       59.770        4.150       20.400        9.770


Results of confluence:
Total flow rate =     56.586(CFS)
Time of concentration =    14.846 min.
Effective stream area after confluence  =     94.090(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      142.000 to Point/Station      134.400
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.416
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  49.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    14.85 min.
Rainfall intensity =      1.153(In/Hr) for a     2.0 year storm
Subarea runoff =      0.858(CFS) for      1.790(Ac.)
Total runoff =     57.444(CFS)   Total area =      95.880(Ac.)
End of computations, total study area =           95.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.724
Area averaged RI index number =  70.6
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 02/07/19 File:EXC002.out

TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA 'C'
EXISTING CONDITION - RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES, FEBRUARY 2019
BY: BRIAN LOWELL, PE

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6407

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation = 0.550(In.)
100 year, 1 hour precipitation = 1.300(In.)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.550(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 756.000(Ft.)
Top (of initial area) elevation = 1719.000(Ft.)
Bottom (of initial area) elevation = 1541.000(Ft.)
Difference in elevation = 178.000(Ft.)
Slope = 0.23545 s(percent)= 23.54
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.030 min.
Rainfall intensity = 1.419(In/Hr) for a 2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.585
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 63.56
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 5.231(CFS)
Total initial stream area = 6.300(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 302.000 to Point/Station 303.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1548.000(Ft.)
End of natural channel elevation = 1528.000(Ft.)
Length of natural channel = 660.000(Ft.)

```
Estimated mean flow rate at midpoint of channel =     10.337(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   4.39(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0303
Corrected/adjusted channel slope =  0.0303
Travel time =    2.51 min.     TC =   12.54  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.558
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.200
RI index for soil(AMC 1)  =  63.28
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.261(In/Hr) for a     2.0 year storm
Subarea runoff =      8.652(CFS) for     12.300(Ac.)
Total runoff =     13.882(CFS)        Total area =      18.600(Ac.)
End of computations, total study area =           18.60 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  80.3
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 05/18/21 File:PRC002.out

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'C'
DEVELOPED CONDITION RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6407

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation = 0.550(In.)
100 year, 1 hour precipitation = 1.300(In.)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.550(In/Hr)
Slope of intensity duration curve = 0.5300

++

Process from Point/Station 300.000 to Point/Station 301.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 500.000(Ft.)
Top (of initial area) elevation = 1566.100(Ft.)
Bottom (of initial area) elevation = 1554.000(Ft.)
Difference in elevation = 12.100(Ft.)
Slope = 0.02420 s(percent)= 2.42
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.860 min.
Rainfall intensity = 1.432(In/Hr) for a 2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.619
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 36.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 1.127(CFS)
Total initial stream area = 1.270(Ac.)
Pervious area fraction = 0.500

++

Process from Point/Station 301.000 to Point/Station 302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1546.000(Ft.)
Downstream point/station elevation = 1545.000(Ft.)
Pipe length = 21.00(Ft.) Manning's N = 0.013

```
No. of pipes = 1  Required pipe flow  =     1.127(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     1.127(CFS)
Normal flow depth in pipe =    4.54(In.)
Flow top width inside pipe =    5.15(In.)
Critical depth could not be calculated.
Pipe flow velocity =      7.08(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =     9.91 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.270(Ac.)
Runoff from this stream =      1.127(CFS)
Time of concentration =    9.91 min.
Rainfall intensity =     1.428(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      303.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   535.000(Ft.)
Top (of initial area) elevation =  1566.100(Ft.)
Bottom (of initial area) elevation =  1554.000(Ft.)
Difference in elevation =    12.100(Ft.)
Slope =    0.02262  s(percent)=       2.26
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.269 min.
Rainfall intensity =      1.402(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.617
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.102(CFS)
Total initial stream area =        2.430(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1546.000(Ft.)
Downstream point/station elevation =  1545.000(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.102(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.102(CFS)
Normal flow depth in pipe =    5.53(In.)
Flow top width inside pipe =    8.76(In.)
Critical Depth =    7.85(In.)
Pipe flow velocity =      7.39(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    10.34 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      302.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.430(Ac.)
```

```
Runoff from this stream =      2.102(CFS)
Time of concentration =   10.34 min.
Rainfall intensity =     1.397(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        1.127      9.91                1.428
2        2.102     10.34                1.397
Largest stream flow has longer time of concentration
Qp =      2.102 + sum of
          Qb         Ia/Ib
           1.127 *    0.978 =      1.102
Qp =      3.204

Total of 2 streams to confluence:
Flow rates before confluence point:
       1.127       2.102
Area of streams before confluence:
        1.270        2.430
Results of confluence:
Total flow rate =      3.204(CFS)
Time of concentration =    10.336 min.
Effective stream area after confluence =      3.700(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1545.000(Ft.)
Downstream point/station elevation =  1540.000(Ft.)
Pipe length  =   271.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.204(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.204(CFS)
Normal flow depth in pipe =    7.14(In.)
Flow top width inside pipe =   11.78(In.)
Critical Depth =    9.20(In.)
Pipe flow velocity =      6.59(Ft/s)
Travel time through pipe =    0.69 min.
Time of concentration (TC) =    11.02 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.700(Ac.)
Runoff from this stream =      3.204(CFS)
Time of concentration =   11.02 min.
Rainfall intensity =     1.350(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      305.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   215.000(Ft.)
Top (of initial area) elevation =  1554.000(Ft.)
Bottom (of initial area) elevation =  1553.500(Ft.)
Difference in elevation =     0.500(Ft.)
Slope =    0.00233  s(percent)=       0.23
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.239 min.
Rainfall intensity =      1.336(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.612
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.121(CFS)
Total initial stream area =        1.370(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      305.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1540.200(Ft.)
Downstream point/station elevation =  1540.000(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.121(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.121(CFS)
Normal flow depth in pipe =    5.43(In.)
Flow top width inside pipe =    8.81(In.)
Critical Depth =    5.84(In.)
Pipe flow velocity =      4.02(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    11.32 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      304.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.370(Ac.)
Runoff from this stream =      1.121(CFS)
Time of concentration =   11.32 min.
Rainfall intensity =     1.331(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        3.204     11.02                1.350
2        1.121     11.32                1.331
Largest stream flow has longer or shorter time of concentration
Qp =      3.204 + sum of
          Qa          Tb/Ta
           1.121 *    0.974 =      1.091
Qp =      4.296

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.204       1.121
Area of streams before confluence:
        3.700        1.370
Results of confluence:
Total flow rate =      4.296(CFS)
Time of concentration =    11.022 min.
Effective stream area after confluence =      5.070(Ac.)


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Process from Point/Station      304.000 to Point/Station      306.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1540.000(Ft.)
Downstream point/station elevation =  1535.000(Ft.)
Pipe length  =   170.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.296(CFS)
```

```
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.296(CFS)
Normal flow depth in pipe =    7.42(In.)
Flow top width inside pipe =   11.66(In.)
Critical Depth =   10.45(In.)
Pipe flow velocity =      8.42(Ft/s)
Travel time through pipe =    0.34 min.
Time of concentration (TC) =    11.36 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      306.100
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      5.070(Ac.)
Runoff from this stream =      4.296(CFS)
Time of concentration =   11.36 min.
Rainfall intensity =     1.329(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      307.000 to Point/Station      308.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------------
Initial area flow distance =   742.000(Ft.)
Top (of initial area) elevation =  1551.900(Ft.)
Bottom (of initial area) elevation =  1538.600(Ft.)
Difference in elevation =    13.300(Ft.)
Slope =    0.01792  s(percent)=       1.79
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.261 min.
Rainfall intensity =      1.276(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.633
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.700
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  41.70
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.608(CFS)
Total initial stream area =        3.230(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      306.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1531.000(Ft.)
Pipe length  =    48.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.608(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.608(CFS)
Normal flow depth in pipe =    6.05(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =    8.31(In.)
Pipe flow velocity =      6.57(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    12.38 min.


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Process from Point/Station      308.000 to Point/Station      306.200
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
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In Main Stream number: 2
Stream flow area =      3.230(Ac.)
Runoff from this stream =      2.608(CFS)
Time of concentration =   12.38 min.
Rainfall intensity =     1.269(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      310.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   647.000(Ft.)
Top (of initial area) elevation =  1719.900(Ft.)
Bottom (of initial area) elevation =  1580.000(Ft.)
Difference in elevation =   139.900(Ft.)
Slope =    0.21623  s(percent)=      21.62
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.586 min.
Rainfall intensity =      1.454(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.629
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.700
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  68.04
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      2.231(CFS)
Total initial stream area =        2.440(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      306.300
**** IMPROVED CHANNEL TRAVEL TIME ****
------------------------------------------------------------------------
Upstream point elevation =  1580.000(Ft.)
Downstream point elevation =  1535.000(Ft.)
Channel length thru subarea  =   532.000(Ft.)
Channel base width     =    0.000(Ft.)
Slope or 'Z' of left channel bank =   1.000
Slope or 'Z' of right channel bank =   1.000
Estimated mean flow rate at midpoint of channel =      3.384(CFS)
Manning's 'N'    = 0.013
Maximum depth of channel  =    1.500(Ft.)
Flow(q) thru subarea =      3.384(CFS)
Depth of flow =   0.551(Ft.), Average velocity =  11.166(Ft/s)
Channel flow top width =    1.101(Ft.)
Flow Velocity =   11.17(Ft/s)
Travel time  =    0.79 min.
Time of concentration =   10.38 min.

Sub-Channel No. 1 Critical depth =      0.938(Ft.)
  '     '       '     Critical flow top width =      1.875(Ft.)
  '     '       '     Critical flow velocity=    3.850(Ft/s)
  '     '       '     Critical flow area =      0.879(Sq.Ft)

 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.601
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  65.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.394(In/Hr) for a     2.0 year storm
Subarea runoff =      2.254(CFS) for      2.690(Ac.)
Total runoff =      4.485(CFS)        Total area =       5.130(Ac.)
Depth of flow =   0.612(Ft.), Average velocity =  11.980(Ft/s)
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Sub-Channel No. 1 Critical depth =      1.047(Ft.)
  '     '       '     Critical flow top width =      2.094(Ft.)
  '     '       '     Critical flow velocity=    4.092(Ft/s)
  '     '       '     Critical flow area =      1.096(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      306.300
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      5.130(Ac.)
Runoff from this stream =      4.485(CFS)
Time of concentration =   10.38 min.
Rainfall intensity =     1.394(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        4.296     11.36               1.329
2        2.608     12.38               1.269
3        4.485     10.38               1.394
Largest stream flow has longer or shorter time of concentration
Qp =      4.485 + sum of
          Qa          Tb/Ta
           4.296 *    0.914 =      3.926
          Qa          Tb/Ta
           2.608 *    0.838 =      2.187
Qp =     10.597

Total of 3 main streams to confluence:
Flow rates before confluence point:
       4.296       2.608       4.485
Area of streams before confluence:
        5.070        3.230        5.130


Results of confluence:
Total flow rate =     10.597(CFS)
Time of concentration =    10.380 min.
Effective stream area after confluence  =     13.430(Ac.)


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Process from Point/Station      310.000 to Point/Station      306.300
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.620
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  67.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    10.38 min.
Rainfall intensity =      1.394(In/Hr) for a     2.0 year storm
Subarea runoff =      0.656(CFS) for      0.760(Ac.)
Total runoff =     11.254(CFS)        Total area =      14.190(Ac.)
End of computations, total study area =           14.19 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.708
Area averaged RI index number =  68.4
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                Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
      Rational Hydrology Study        Date: 04/30/21  File:EXD002.out
------------------------------------------------------------------------
TRACT 31194 - 'GOLDEN MEADOWS' HYDROLOGY STUDY – AREA ‘D’
EXISTING CONDITION - RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES,
BY: BRIAN LOWELL, PE
------------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

 English (in-lb) Units used in input data file

------------------------------------------------------------------------


Program License Serial Number 6406

------------------------------------------------------------------------
Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =    2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation =  0.550(In.)
100 year, 1 hour precipitation =  1.300(In.)

Storm event year =   2.0
Calculated rainfall intensity data:
1 hour intensity =  0.550(In/Hr)
Slope of intensity duration curve = 0.5300




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Process from Point/Station      401.000 to Point/Station      402.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1778.000(Ft.)
Bottom (of initial area) elevation =  1553.000(Ft.)
Difference in elevation =   225.000(Ft.)
Slope =    0.22500  s(percent)=      22.50
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.320 min.
Rainfall intensity =      1.331(In/Hr) for a     2.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.592
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  65.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      7.879(CFS)
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Total initial stream area =       10.000(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      403.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1553.000(Ft.)
End of natural channel elevation =   1527.000(Ft.)
Length of natural channel  =   987.000(Ft.)
Estimated mean flow rate at midpoint of channel =     24.347(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   5.13(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
      Normal channel slope =  0.0263
Corrected/adjusted channel slope =  0.0263
Travel time =    3.21 min.     TC =   14.53  min.


 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.565
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  65.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.166(In/Hr) for a     2.0 year storm
Subarea runoff =     27.525(CFS) for     41.800(Ac.)
Total runoff =     35.404(CFS)  Total area =      51.800(Ac.)
End of computations, total study area =           51.80 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  82.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 05/18/21 File:PRD002.out

TRACT 31194 - 'GOLDEN MEADOWS' MAJOR MODIFICATION
PRELIMINARY HYDROLOGY STUDY – AREA 'D'
DEVELOPED CONDITION RATIONAL METHOD - 2 YEAR STORM
HUNSAKER & ASSOCIATES, MAY 2021, BRIAN LOWELL, PE

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6407

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation = 0.550(In.)
100 year, 1 hour precipitation = 1.300(In.)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.550(In/Hr)
Slope of intensity duration curve = 0.5300

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Process from Point/Station 470.000 to Point/Station 471.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)
Top (of initial area) elevation = 1566.100(Ft.)
Bottom (of initial area) elevation = 1546.000(Ft.)
Difference in elevation = 20.100(Ft.)
Slope = 0.02010 s(percent)= 2.01
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.503 min.
Rainfall intensity = 1.212(In/Hr) for a 2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.602
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 36.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 3.826(CFS)
Total initial stream area = 5.240(Ac.)
Pervious area fraction = 0.500

++

Process from Point/Station 471.000 to Point/Station 439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1538.000(Ft.)
Downstream point/station elevation = 1533.400(Ft.)
Pipe length = 353.00(Ft.) Manning's N = 0.013

```
No. of pipes = 1  Required pipe flow  =     3.826(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.826(CFS)
Normal flow depth in pipe =    9.26(In.)
Flow top width inside pipe =   10.08(In.)
Critical Depth =    9.98(In.)
Pipe flow velocity =      5.89(Ft/s)
Travel time through pipe =    1.00 min.
Time of concentration (TC) =    14.50 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      471.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      5.240(Ac.)
Runoff from this stream =      3.826(CFS)
Time of concentration =   14.50 min.
Rainfall intensity =     1.167(In/Hr)


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Process from Point/Station      473.000 to Point/Station      443.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   759.000(Ft.)
Top (of initial area) elevation =  1552.000(Ft.)
Bottom (of initial area) elevation =  1539.800(Ft.)
Difference in elevation =    12.200(Ft.)
Slope =    0.01607  s(percent)=       1.61
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.646 min.
Rainfall intensity =      1.255(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.606
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.141(CFS)
Total initial stream area =        4.130(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      443.000 to Point/Station      439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    28.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.141(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.141(CFS)
Normal flow depth in pipe =    7.66(In.)
Flow top width inside pipe =   11.53(In.)
Critical Depth =    9.11(In.)
Pipe flow velocity =      5.93(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    12.72 min.


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Process from Point/Station      443.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.130(Ac.)
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Runoff from this stream =      3.141(CFS)
Time of concentration =   12.72 min.
Rainfall intensity =     1.251(In/Hr)


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Process from Point/Station      474.000 to Point/Station      441.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =    96.000(Ft.)
Top (of initial area) elevation =  1543.200(Ft.)
Bottom (of initial area) elevation =  1539.800(Ft.)
Difference in elevation =     3.400(Ft.)
Slope =    0.03542  s(percent)=       3.54
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.053(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.752
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.154(CFS)
Total initial stream area =        0.100(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      441.000 to Point/Station      439.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    31.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.154(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.154(CFS)
Normal flow depth in pipe =    2.01(In.)
Flow top width inside pipe =    5.66(In.)
Critical Depth =    2.35(In.)
Pipe flow velocity =      2.67(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =     5.19 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      441.000 to Point/Station      439.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      0.100(Ac.)
Runoff from this stream =      0.154(CFS)
Time of concentration =    5.19 min.
Rainfall intensity =     2.012(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        3.826     14.50                1.167
2        3.141     12.72                1.251
3        0.154      5.19                2.012
Largest stream flow has longer time of concentration
Qp =      3.826 + sum of
          Qb         Ia/Ib
```

```
          3.141 *    0.933 =      2.930
         Qb         Ia/Ib
          0.154 *    0.580 =      0.090
Qp =      6.846

Total of 3 streams to confluence:
Flow rates before confluence point:
       3.826       3.141       0.154
Area of streams before confluence:
        5.240       4.130       0.100
Results of confluence:
Total flow rate =      6.846(CFS)
Time of concentration =    14.502 min.
Effective stream area after confluence =      9.470(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      439.000 to Point/Station      444.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.400(Ft.)
Downstream point/station elevation =  1532.500(Ft.)
Pipe length  =    72.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.846(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.846(CFS)
Normal flow depth in pipe =   11.65(In.)
Flow top width inside pipe =   12.50(In.)
Critical Depth =   12.60(In.)
Pipe flow velocity =      6.70(Ft/s)
Travel time through pipe =    0.18 min.
Time of concentration (TC) =    14.68 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      439.000 to Point/Station      444.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      9.470(Ac.)
Runoff from this stream =      6.846(CFS)
Time of concentration =   14.68 min.
Rainfall intensity =     1.160(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      445.000 to Point/Station      446.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =    42.000(Ft.)
Top (of initial area) elevation =  1540.500(Ft.)
Bottom (of initial area) elevation =  1539.400(Ft.)
Difference in elevation =     1.100(Ft.)
Slope =    0.02619  s(percent)=       2.62
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.053(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.659
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.081(CFS)
Total initial stream area =        0.060(Ac.)
```

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Pervious area fraction = 0.500


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Process from Point/Station      446.000 to Point/Station      447.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.081(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.081(CFS)
Normal flow depth in pipe =    1.13(In.)
Flow top width inside pipe =    8.73(In.)
Critical Depth =    1.25(In.)
Pipe flow velocity =      1.77(Ft/s)
Travel time through pipe =    0.38 min.
Time of concentration (TC) =     5.38 min.


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Process from Point/Station      446.000 to Point/Station      447.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.060(Ac.)
Runoff from this stream =      0.081(CFS)
Time of concentration =    5.38 min.
Rainfall intensity =     1.975(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      448.000 to Point/Station      449.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   640.000(Ft.)
Top (of initial area) elevation =  1587.200(Ft.)
Bottom (of initial area) elevation =  1540.300(Ft.)
Difference in elevation =    46.900(Ft.)
Slope =    0.07328  s(percent)=       7.33
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.876 min.
Rainfall intensity =      1.113(In/Hr) for a     2.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.462
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  55.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      0.313(CFS)
Total initial stream area =        0.610(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      449.000 to Point/Station      447.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1533.800(Ft.)
Downstream point/station elevation =  1533.400(Ft.)
Pipe length  =    35.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.313(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.313(CFS)
Normal flow depth in pipe =    2.07(In.)
Flow top width inside pipe =   11.48(In.)
Critical depth could not be calculated.
Pipe flow velocity =      2.78(Ft/s)
```

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Travel time through pipe =    0.21 min.
Time of concentration (TC) =    16.09 min.


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Process from Point/Station      449.000 to Point/Station      447.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      0.610(Ac.)
Runoff from this stream =      0.313(CFS)
Time of concentration =   16.09 min.
Rainfall intensity =     1.105(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        0.081      5.38                1.975
2        0.313     16.09                1.105
Largest stream flow has longer time of concentration
Qp =      0.313 + sum of
          Qb         Ia/Ib
           0.081 *    0.559 =      0.045
Qp =      0.359

Total of 2 streams to confluence:
Flow rates before confluence point:
       0.081       0.313
Area of streams before confluence:
        0.060        0.610
Results of confluence:
Total flow rate =      0.359(CFS)
Time of concentration =    16.085 min.
Effective stream area after confluence =      0.670(Ac.)


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Process from Point/Station      447.000 to Point/Station      444.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1533.400(Ft.)
Downstream point/station elevation =  1532.500(Ft.)
Pipe length  =    89.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.359(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =     0.359(CFS)
Normal flow depth in pipe =    2.10(In.)
Flow top width inside pipe =   13.57(In.)
Critical depth could not be calculated.
Pipe flow velocity =      2.67(Ft/s)
Travel time through pipe =    0.56 min.
Time of concentration (TC) =    16.64 min.


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Process from Point/Station      447.000 to Point/Station      444.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.670(Ac.)
Runoff from this stream =      0.359(CFS)
Time of concentration =   16.64 min.
Rainfall intensity =     1.085(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1        6.846     14.68               1.160
2        0.359     16.64               1.085
Largest stream flow has longer or shorter time of concentration
Qp =      6.846 + sum of
          Qa          Tb/Ta
           0.359 *    0.882 =      0.317
Qp =      7.163

Total of 2 main streams to confluence:
Flow rates before confluence point:
       6.846       0.359
Area of streams before confluence:
        9.470        0.670


Results of confluence:
Total flow rate =      7.163(CFS)
Time of concentration =    14.681 min.
Effective stream area after confluence  =     10.140(Ac.)


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Process from Point/Station      444.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1532.500(Ft.)
Downstream point/station elevation =  1532.000(Ft.)
Pipe length  =    46.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.163(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =     7.163(CFS)
Normal flow depth in pipe =    9.07(In.)
Flow top width inside pipe =   23.27(In.)
Critical Depth =   11.40(In.)
Pipe flow velocity =      6.58(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    14.80 min.


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Process from Point/Station      444.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     10.140(Ac.)
Runoff from this stream =      7.163(CFS)
Time of concentration =   14.80 min.
Rainfall intensity =     1.155(In/Hr)


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Process from Point/Station      451.000 to Point/Station      452.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   388.000(Ft.)
Top (of initial area) elevation =  1543.800(Ft.)
Bottom (of initial area) elevation =  1540.100(Ft.)
Difference in elevation =     3.700(Ft.)
Slope =    0.00954  s(percent)=       0.95
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.733 min.
Rainfall intensity =      1.369(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.615
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  36.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
```

```
Initial subarea runoff =      0.219(CFS)
Total initial stream area =        0.260(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      452.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1532.700(Ft.)
Downstream point/station elevation =  1532.000(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.219(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     0.219(CFS)
Normal flow depth in pipe =    1.56(In.)
Flow top width inside pipe =   10.12(In.)
Critical Depth =    2.05(In.)
Pipe flow velocity =      2.95(Ft/s)
Travel time through pipe =    0.21 min.
Time of concentration (TC) =    10.95 min.


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Process from Point/Station      452.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.260(Ac.)
Runoff from this stream =      0.219(CFS)
Time of concentration =   10.95 min.
Rainfall intensity =     1.355(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        7.163     14.80                1.155
2        0.219     10.95                1.355
Largest stream flow has longer time of concentration
Qp =      7.163 + sum of
          Qb         Ia/Ib
           0.219 *    0.852 =      0.187
Qp =      7.350

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.163       0.219
Area of streams before confluence:
       10.140        0.260
Results of confluence:
Total flow rate =      7.350(CFS)
Time of concentration =    14.798 min.
Effective stream area after confluence =     10.400(Ac.)


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Process from Point/Station      450.000 to Point/Station      459.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1532.000(Ft.)
Downstream point/station elevation =  1526.000(Ft.)
Pipe length  =   418.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.350(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =     7.350(CFS)
Normal flow depth in pipe =    7.38(In.)
Flow top width inside pipe =   29.06(In.)
Critical Depth =   10.24(In.)
Pipe flow velocity =      7.05(Ft/s)
```

```
Travel time through pipe =    0.99 min.
Time of concentration (TC) =    15.79 min.


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Process from Point/Station      450.000 to Point/Station      459.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     10.400(Ac.)
Runoff from this stream =      7.350(CFS)
Time of concentration =   15.79 min.
Rainfall intensity =     1.116(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      418.000 to Point/Station      419.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------------
Initial area flow distance =   332.000(Ft.)
Top (of initial area) elevation =  1544.200(Ft.)
Bottom (of initial area) elevation =  1539.000(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01566  s(percent)=       1.57
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.132 min.
Rainfall intensity =      1.492(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.719
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.469(CFS)
Total initial stream area =        1.370(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      419.000 to Point/Station      459.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1531.000(Ft.)
Downstream point/station elevation =  1526.000(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.469(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.469(CFS)
Normal flow depth in pipe =    2.63(In.)
Flow top width inside pipe =   12.71(In.)
Critical Depth =    5.44(In.)
Pipe flow velocity =      9.19(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =     9.23 min.


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Process from Point/Station      419.000 to Point/Station      459.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.370(Ac.)
Runoff from this stream =      1.469(CFS)
Time of concentration =    9.23 min.
Rainfall intensity =     1.483(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)
```

```
1        7.350     15.79                 1.116
2        1.469      9.23                 1.483
Largest stream flow has longer time of concentration
Qp =      7.350 + sum of
          Qb         Ia/Ib
           1.469 *    0.752 =      1.105
Qp =      8.455

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.350       1.469
Area of streams before confluence:
       10.400        1.370
Results of confluence:
Total flow rate =      8.455(CFS)
Time of concentration =    15.785 min.
Effective stream area after confluence =     11.770(Ac.)


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Process from Point/Station      459.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1526.000(Ft.)
Downstream point/station elevation =  1523.700(Ft.)
Pipe length  =   316.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.455(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =     8.455(CFS)
Normal flow depth in pipe =    9.38(In.)
Flow top width inside pipe =   31.60(In.)
Critical Depth =   11.00(In.)
Pipe flow velocity =      5.77(Ft/s)
Travel time through pipe =    0.91 min.
Time of concentration (TC) =    16.70 min.


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Process from Point/Station      459.000 to Point/Station      420.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     11.770(Ac.)
Runoff from this stream =      8.455(CFS)
Time of concentration =   16.70 min.
Rainfall intensity =     1.083(In/Hr)


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Process from Point/Station      421.000 to Point/Station      422.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   508.000(Ft.)
Top (of initial area) elevation =  1541.200(Ft.)
Bottom (of initial area) elevation =  1535.400(Ft.)
Difference in elevation =     5.800(Ft.)
Slope =    0.01142  s(percent)=       1.14
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.532 min.
Rainfall intensity =      1.318(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.664
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.400
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.600
RI index for soil(AMC 1)  =  47.88
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.451(CFS)
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Total initial stream area =        2.800(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      422.000 to Point/Station      420.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1528.300(Ft.)
Downstream point/station elevation =  1523.700(Ft.)
Pipe length  =    52.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.451(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     2.451(CFS)
Normal flow depth in pipe =    3.41(In.)
Flow top width inside pipe =   14.11(In.)
Critical Depth =    7.10(In.)
Pipe flow velocity =     10.53(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    11.61 min.


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Process from Point/Station      422.000 to Point/Station      420.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      2.800(Ac.)
Runoff from this stream =      2.451(CFS)
Time of concentration =   11.61 min.
Rainfall intensity =     1.313(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1        8.455     16.70                1.083
2        2.451     11.61                1.313
Largest stream flow has longer time of concentration
Qp =      8.455 + sum of
          Qb         Ia/Ib
           2.451 *    0.825 =      2.022
Qp =     10.477

Total of 2 streams to confluence:
Flow rates before confluence point:
       8.455       2.451
Area of streams before confluence:
       11.770        2.800
Results of confluence:
Total flow rate =     10.477(CFS)
Time of concentration =    16.697 min.
Effective stream area after confluence =     14.570(Ac.)


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Process from Point/Station      420.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1523.700(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =   350.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.477(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    10.477(CFS)
Normal flow depth in pipe =   10.31(In.)
Flow top width inside pipe =   32.55(In.)
Critical Depth =   12.29(In.)
Pipe flow velocity =      6.27(Ft/s)
Travel time through pipe =    0.93 min.
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Time of concentration (TC) =    17.63 min.


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Process from Point/Station      420.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     14.570(Ac.)
Runoff from this stream =     10.477(CFS)
Time of concentration =   17.63 min.
Rainfall intensity =     1.053(In/Hr)


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Process from Point/Station      415.000 to Point/Station      416.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =  1545.700(Ft.)
Bottom (of initial area) elevation =  1530.400(Ft.)
Difference in elevation =    15.300(Ft.)
Slope =    0.01530  s(percent)=       1.53
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.260 min.
Rainfall intensity =      1.178(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.672
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.200
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.800
RI index for soil(AMC 1)  =  52.44
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.842(CFS)
Total initial stream area =        3.590(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      416.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1523.300(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =    26.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.842(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     2.842(CFS)
Normal flow depth in pipe =    3.67(In.)
Flow top width inside pipe =   14.50(In.)
Critical Depth =    7.68(In.)
Pipe flow velocity =     11.00(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    14.30 min.


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Process from Point/Station      416.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.590(Ac.)
Runoff from this stream =      2.842(CFS)
Time of concentration =   14.30 min.
Rainfall intensity =     1.176(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      421.000 to Point/Station      423.000
**** INITIAL AREA EVALUATION ****
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Initial area flow distance =   790.000(Ft.)
Top (of initial area) elevation =  1541.200(Ft.)
Bottom (of initial area) elevation =  1530.400(Ft.)
Difference in elevation =    10.800(Ft.)
Slope =    0.01367  s(percent)=       1.37
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.273 min.
Rainfall intensity =      1.224(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.612
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.900
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.100
RI index for soil(AMC 1)  =  37.90
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.422(CFS)
Total initial stream area =        1.900(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      423.000 to Point/Station      417.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1523.300(Ft.)
Downstream point/station elevation =  1521.000(Ft.)
Pipe length  =    24.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.422(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.422(CFS)
Normal flow depth in pipe =    2.57(In.)
Flow top width inside pipe =   12.58(In.)
Critical Depth =    5.36(In.)
Pipe flow velocity =      9.21(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =    13.32 min.


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Process from Point/Station      423.000 to Point/Station      417.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      1.900(Ac.)
Runoff from this stream =      1.422(CFS)
Time of concentration =   13.32 min.
Rainfall intensity =     1.221(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       10.477     17.63                1.053
2        2.842     14.30                1.176
3        1.422     13.32                1.221
Largest stream flow has longer time of concentration
Qp =     10.477 + sum of
          Qb         Ia/Ib
           2.842 *    0.895 =      2.543
          Qb         Ia/Ib
           1.422 *    0.862 =      1.225
Qp =     14.246

Total of 3 streams to confluence:
Flow rates before confluence point:
      10.477       2.842       1.422
Area of streams before confluence:
       14.570        3.590        1.900
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Results of confluence:
Total flow rate =     14.246(CFS)
Time of concentration =    17.628 min.
Effective stream area after confluence =     20.060(Ac.)


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Process from Point/Station      417.000 to Point/Station      414.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1521.000(Ft.)
Downstream point/station elevation =  1518.500(Ft.)
Pipe length  =   388.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.246(CFS)
Given pipe size =     48.00(In.)
Calculated individual pipe flow  =    14.246(CFS)
Normal flow depth in pipe =   11.39(In.)
Flow top width inside pipe =   40.84(In.)
Critical Depth =   13.24(In.)
Pipe flow velocity =      6.24(Ft/s)
Travel time through pipe =    1.04 min.
Time of concentration (TC) =    18.66 min.


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Process from Point/Station      417.000 to Point/Station      414.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     20.060(Ac.)
Runoff from this stream =     14.246(CFS)
Time of concentration =   18.66 min.
Rainfall intensity =     1.021(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   490.000(Ft.)
Top (of initial area) elevation =  1545.600(Ft.)
Bottom (of initial area) elevation =  1540.400(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01061  s(percent)=       1.06
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.534 min.
Rainfall intensity =      1.318(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.640
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  42.50
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.527(CFS)
Total initial stream area =        1.810(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      401.000 to Point/Station      402.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =  1540.400(Ft.)
End of street segment elevation =  1532.700(Ft.)
Length of street segment  =   763.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
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Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      3.277(CFS)
Depth of flow =   0.299(Ft.), Average velocity =   2.664(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  10.700(Ft.)
Flow velocity =   2.66(Ft/s)
Travel time =    4.77 min.     TC =   16.31  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.641
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.300
RI index for soil(AMC 1)  =  47.28
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.097(In/Hr) for a     2.0 year storm
Subarea runoff =      3.411(CFS) for      4.850(Ac.)
Total runoff =      4.938(CFS)       Total area =       6.660(Ac.)
Street flow at end of street =      4.938(CFS)
Half street flow at end of street =      4.938(CFS)
Depth of flow =   0.338(Ft.), Average velocity =   2.939(Ft/s)
Flow width (from curb towards crown)=  12.629(Ft.)


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Process from Point/Station      402.000 to Point/Station      403.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =  1532.700(Ft.)
End of street segment elevation =  1529.300(Ft.)
Length of street segment  =   380.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      5.471(CFS)
Depth of flow =   0.354(Ft.), Average velocity =   2.879(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.474(Ft.)
Flow velocity =   2.88(Ft/s)
Travel time =    2.20 min.     TC =   18.51  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.599
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.100
RI index for soil(AMC 1)  =  39.20
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.026(In/Hr) for a     2.0 year storm
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Subarea runoff =      1.014(CFS) for      1.650(Ac.)
Total runoff =      5.952(CFS)        Total area =       8.310(Ac.)
Street flow at end of street =      5.952(CFS)
Half street flow at end of street =      5.952(CFS)
Depth of flow =   0.364(Ft.), Average velocity =   2.938(Ft/s)
Flow width (from curb towards crown)=  13.931(Ft.)


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Process from Point/Station      403.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    35.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.952(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     5.952(CFS)
Normal flow depth in pipe =    7.92(In.)
Flow top width inside pipe =   17.87(In.)
Critical Depth =   11.31(In.)
Pipe flow velocity =      7.94(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    18.58 min.


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Process from Point/Station      403.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      8.310(Ac.)
Runoff from this stream =      5.952(CFS)
Time of concentration =   18.58 min.
Rainfall intensity =     1.024(In/Hr)


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Process from Point/Station      400.000 to Point/Station      405.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   530.000(Ft.)
Top (of initial area) elevation =  1545.600(Ft.)
Bottom (of initial area) elevation =  1540.600(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.00943  s(percent)=       0.94
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.185 min.
Rainfall intensity =      1.280(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.619
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.200
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  38.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      2.006(CFS)
Total initial stream area =        2.530(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      405.000 to Point/Station      406.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of street segment elevation =  1540.600(Ft.)
End of street segment elevation =  1532.700(Ft.)
Length of street segment  =   777.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
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Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      2.843(CFS)
Depth of flow =   0.287(Ft.), Average velocity =   2.584(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  10.077(Ft.)
Flow velocity =   2.58(Ft/s)
Travel time =    5.01 min.     TC =   17.20  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.662
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.600
Decimal fraction soil group D = 0.400
RI index for soil(AMC 1)  =  52.68
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.067(In/Hr) for a     2.0 year storm
Subarea runoff =      1.624(CFS) for      2.300(Ac.)
Total runoff =      3.630(CFS)       Total area =       4.830(Ac.)
Street flow at end of street =      3.630(CFS)
Half street flow at end of street =      3.630(CFS)
Depth of flow =   0.308(Ft.), Average velocity =   2.738(Ft/s)
Flow width (from curb towards crown)=  11.140(Ft.)


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Process from Point/Station      406.000 to Point/Station      407.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =  1532.700(Ft.)
End of street segment elevation =  1529.300(Ft.)
Length of street segment  =   343.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      4.775(CFS)
Depth of flow =   0.335(Ft.), Average velocity =   2.896(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  12.506(Ft.)
Flow velocity =   2.90(Ft/s)
Travel time =    1.97 min.     TC =   19.17  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.621
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.400
RI index for soil(AMC 1)  =  44.90
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      1.007(In/Hr) for a     2.0 year storm
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Subarea runoff =      2.234(CFS) for      3.570(Ac.)
Total runoff =      5.864(CFS)        Total area =       8.400(Ac.)
Street flow at end of street =      5.864(CFS)
Half street flow at end of street =      5.864(CFS)
Depth of flow =   0.356(Ft.), Average velocity =   3.043(Ft/s)
Flow width (from curb towards crown)=  13.571(Ft.)


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Process from Point/Station      407.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    36.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.864(CFS)
Given pipe size =     24.00(In.)
Calculated individual pipe flow  =     5.864(CFS)
Normal flow depth in pipe =    7.01(In.)
Flow top width inside pipe =   21.82(In.)
Critical Depth =   10.26(In.)
Pipe flow velocity =      7.68(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    19.25 min.


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Process from Point/Station      407.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      8.400(Ac.)
Runoff from this stream =      5.864(CFS)
Time of concentration =   19.25 min.
Rainfall intensity =     1.005(In/Hr)


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Process from Point/Station      408.000 to Point/Station      409.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   395.000(Ft.)
Top (of initial area) elevation =  1533.500(Ft.)
Bottom (of initial area) elevation =  1529.200(Ft.)
Difference in elevation =     4.300(Ft.)
Slope =    0.01089  s(percent)=       1.09
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.528 min.
Rainfall intensity =      1.383(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.659
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      0.985(CFS)
Total initial stream area =        1.080(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      409.000 to Point/Station      404.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1522.800(Ft.)
Downstream point/station elevation =  1522.100(Ft.)
Pipe length  =    45.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.985(CFS)
Given pipe size =     18.00(In.)
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Calculated individual pipe flow  =     0.985(CFS)
Normal flow depth in pipe =    3.34(In.)
Flow top width inside pipe =   13.99(In.)
Critical Depth =    4.43(In.)
Pipe flow velocity =      4.36(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =    10.70 min.


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Process from Point/Station      409.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      1.080(Ac.)
Runoff from this stream =      0.985(CFS)
Time of concentration =   10.70 min.
Rainfall intensity =     1.372(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        5.952     18.58                1.024
2        5.864     19.25                1.005
3        0.985     10.70                1.372
Largest stream flow has longer or shorter time of concentration
Qp =      5.952 + sum of
          Qa          Tb/Ta
           5.864 *    0.965 =      5.660
          Qb         Ia/Ib
           0.985 *    0.746 =      0.735
Qp =     12.347

Total of 3 streams to confluence:
Flow rates before confluence point:
       5.952       5.864       0.985
Area of streams before confluence:
        8.310        8.400        1.080
Results of confluence:
Total flow rate =     12.347(CFS)
Time of concentration =    18.581 min.
Effective stream area after confluence =     17.790(Ac.)


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Process from Point/Station      404.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1522.100(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =   322.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.347(CFS)
Given pipe size =     30.00(In.)
Calculated individual pipe flow  =    12.347(CFS)
Normal flow depth in pipe =   11.12(In.)
Flow top width inside pipe =   28.98(In.)
Critical Depth =   14.13(In.)
Pipe flow velocity =      7.46(Ft/s)
Travel time through pipe =    0.72 min.
Time of concentration (TC) =    19.30 min.


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Process from Point/Station      404.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =     17.790(Ac.)
Runoff from this stream =     12.347(CFS)
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Time of concentration =   19.30 min.
Rainfall intensity =     1.003(In/Hr)


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Process from Point/Station      411.000 to Point/Station      412.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   515.000(Ft.)
Top (of initial area) elevation =  1531.500(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     5.800(Ft.)
Slope =    0.01126  s(percent)=       1.13
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.627 min.
Rainfall intensity =      1.312(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.689
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  53.40
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.039(CFS)
Total initial stream area =        1.150(Ac.)
Pervious area fraction = 0.500


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Process from Point/Station      412.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1518.900(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.039(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.039(CFS)
Normal flow depth in pipe =    3.82(In.)
Flow top width inside pipe =   14.72(In.)
Critical Depth =    4.56(In.)
Pipe flow velocity =      3.79(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    11.71 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      412.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      1.150(Ac.)
Runoff from this stream =      1.039(CFS)
Time of concentration =   11.71 min.
Rainfall intensity =     1.307(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      407.000 to Point/Station      413.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   311.000(Ft.)
Top (of initial area) elevation =  1528.400(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     2.700(Ft.)
Slope =    0.00868  s(percent)=       0.87
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.010 min.
Rainfall intensity =      1.421(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
```

```
Runoff Coefficient = 0.636
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.800
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.200
RI index for soil(AMC 1)  =  39.80
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      1.003(CFS)
Total initial stream area =        1.110(Ac.)
Pervious area fraction = 0.500


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      413.000 to Point/Station      410.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1518.900(Ft.)
Downstream point/station elevation =  1518.700(Ft.)
Pipe length  =    25.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.003(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     1.003(CFS)
Normal flow depth in pipe =    3.97(In.)
Flow top width inside pipe =   14.93(In.)
Critical Depth =    4.47(In.)
Pipe flow velocity =      3.47(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    10.13 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      413.000 to Point/Station      410.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      1.110(Ac.)
Runoff from this stream =      1.003(CFS)
Time of concentration =   10.13 min.
Rainfall intensity =     1.412(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       12.347     19.30                1.003
2        1.039     11.71                1.307
3        1.003     10.13                1.412
Largest stream flow has longer time of concentration
Qp =     12.347 + sum of
          Qb         Ia/Ib
           1.039 *    0.768 =      0.798
          Qb         Ia/Ib
           1.003 *    0.711 =      0.713
Qp =     13.858

Total of 3 streams to confluence:
Flow rates before confluence point:
      12.347       1.039       1.003
Area of streams before confluence:
       17.790        1.150        1.110
Results of confluence:
Total flow rate =     13.858(CFS)
Time of concentration =    19.300 min.
Effective stream area after confluence =     20.050(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      410.000 to Point/Station      414.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
```

```
Upstream point/station elevation =  1518.700(Ft.)
Downstream point/station elevation =  1518.500(Ft.)
Pipe length  =    55.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.858(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    13.858(CFS)
Normal flow depth in pipe =   20.02(In.)
Flow top width inside pipe =   17.86(In.)
Critical Depth =   16.09(In.)
Pipe flow velocity =      4.95(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    19.49 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      410.000 to Point/Station      414.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     20.050(Ac.)
Runoff from this stream =     13.858(CFS)
Time of concentration =   19.49 min.
Rainfall intensity =     0.998(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       14.246     18.66               1.021
2       13.858     19.49               0.998
Largest stream flow has longer or shorter time of concentration
Qp =     14.246 + sum of
          Qa          Tb/Ta
          13.858 *    0.958 =     13.273
Qp =     27.519

Total of 2 main streams to confluence:
Flow rates before confluence point:
      14.246      13.858
Area of streams before confluence:
       20.060       20.050


Results of confluence:
Total flow rate =     27.519(CFS)
Time of concentration =    18.664 min.
Effective stream area after confluence  =     40.110(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      414.000 to Point/Station      424.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1518.500(Ft.)
Downstream point/station elevation =  1515.200(Ft.)
Pipe length  =   235.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    27.519(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    27.519(CFS)
Normal flow depth in pipe =   20.30(In.)
Flow top width inside pipe =   17.34(In.)
Critical Depth =   21.83(In.)
Pipe flow velocity =      9.71(Ft/s)
Travel time through pipe =    0.40 min.
Time of concentration (TC) =    19.07 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      414.000 to Point/Station      424.000
```

**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 40.110(Ac.)
Runoff from this stream = 27.519(CFS)
Time of concentration = 19.07 min.
Rainfall intensity = 1.010(In/Hr)

++
Process from Point/Station 408.000 to Point/Station 425.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 597.000(Ft.)
Top (of initial area) elevation = 1533.500(Ft.)
Bottom (of initial area) elevation = 1525.600(Ft.)
Difference in elevation = 7.900(Ft.)
Slope = 0.01323 s(percent)= 1.32
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.943 min.
Rainfall intensity = 1.294(In/Hr) for a 2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.663
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.300
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.400
RI index for soil(AMC 1) = 48.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 2.512(CFS)
Total initial stream area = 2.930(Ac.)
Pervious area fraction = 0.500

++
Process from Point/Station 425.000 to Point/Station 424.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1519.600(Ft.)
Downstream point/station elevation = 1515.200(Ft.)
Pipe length = 63.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.512(CFS)
Nearest computed pipe diameter = 9.00(In.)
Calculated individual pipe flow = 2.512(CFS)
Normal flow depth in pipe = 4.89(In.)
Flow top width inside pipe = 8.97(In.)
Critical Depth = 8.32(In.)
Pipe flow velocity = 10.24(Ft/s)
Travel time through pipe = 0.10 min.
Time of concentration (TC) = 12.05 min.

++
Process from Point/Station 425.000 to Point/Station 424.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 2.930(Ac.)
Runoff from this stream = 2.512(CFS)
Time of concentration = 12.05 min.
Rainfall intensity = 1.288(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	27.519	19.07	1.010
2	2.512	12.05	1.288

Largest stream flow has longer time of concentration
Qp = 27.519 + sum of

```
          Qb         Ia/Ib
           2.512 *    0.784 =      1.969
Qp =     29.489

Total of 2 streams to confluence:
Flow rates before confluence point:
      27.519       2.512
Area of streams before confluence:
       40.110        2.930
Results of confluence:
Total flow rate =     29.489(CFS)
Time of concentration =    19.068 min.
Effective stream area after confluence =     43.040(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      424.000 to Point/Station      426.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1515.200(Ft.)
Downstream point/station elevation =  1515.100(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    29.489(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    29.489(CFS)
Normal flow depth in pipe =   25.08(In.)
Flow top width inside pipe =   22.22(In.)
Critical Depth =   22.22(In.)
Pipe flow velocity =      6.73(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    19.12 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      424.000 to Point/Station      426.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     43.040(Ac.)
Runoff from this stream =     29.489(CFS)
Time of concentration =   19.12 min.
Rainfall intensity =     1.008(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      416.000 to Point/Station      427.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   708.000(Ft.)
Top (of initial area) elevation =  1530.400(Ft.)
Bottom (of initial area) elevation =  1525.700(Ft.)
Difference in elevation =     4.700(Ft.)
Slope =    0.00664  s(percent)=       0.66
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.678 min.
Rainfall intensity =      1.160(In/Hr) for a     2.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.640
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.500
RI index for soil(AMC 1)  =  45.60
Pervious area fraction =  0.500; Impervious fraction =  0.500
Initial subarea runoff =      3.443(CFS)
Total initial stream area =        4.640(Ac.)
Pervious area fraction = 0.500
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      427.000 to Point/Station      428.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
Top of street segment elevation =  1525.700(Ft.)
End of street segment elevation =  1521.200(Ft.)
Length of street segment  =   760.000(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =   9.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [1] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  1.500(In.)
 Manning's N in gutter =  0.0130
 Manning's N from gutter to grade break =  0.0130
 Manning's N from grade break to crown =  0.0130
Estimated mean flow rate at midpoint of street =      4.137(CFS)
Depth of flow =   0.347(Ft.), Average velocity =   2.301(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  13.089(Ft.)
Flow velocity =   2.30(Ft/s)
Travel time =    5.51 min.     TC =   20.18  min.
 Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.672
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1)  =  57.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
Rainfall intensity =      0.980(In/Hr) for a     2.0 year storm
Subarea runoff =      1.304(CFS) for      1.980(Ac.)
Total runoff =      4.747(CFS)       Total area =       6.620(Ac.)
Street flow at end of street =      4.747(CFS)
Half street flow at end of street =      4.747(CFS)
Depth of flow =   0.361(Ft.), Average velocity =   2.379(Ft/s)
Flow width (from curb towards crown)=  13.823(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      428.000 to Point/Station      429.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1518.000(Ft.)
Downstream point/station elevation =  1515.000(Ft.)
Pipe length  =    52.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.747(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.747(CFS)
Normal flow depth in pipe =    6.39(In.)
Flow top width inside pipe =   11.98(In.)
Critical Depth =   10.83(In.)
Pipe flow velocity =     11.18(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    20.26 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      428.000 to Point/Station      429.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.620(Ac.)
Runoff from this stream =      4.747(CFS)
Time of concentration =   20.26 min.
```

```
Rainfall intensity =     0.978(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       29.489     19.12               1.008
2        4.747     20.26               0.978
Largest stream flow has longer or shorter time of concentration
Qp =     29.489 + sum of
          Qa          Tb/Ta
           4.747 *    0.944 =      4.479
Qp =     33.968

Total of 2 main streams to confluence:
Flow rates before confluence point:
      29.489       4.747
Area of streams before confluence:
       43.040        6.620


Results of confluence:
Total flow rate =     33.968(CFS)
Time of concentration =    19.117 min.
Effective stream area after confluence  =     49.660(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      428.000 to Point/Station      429.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.486
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.300
Decimal fraction soil group D = 0.700
RI index for soil(AMC 1)  =  60.84
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    19.12 min.
Rainfall intensity =      1.008(In/Hr) for a     2.0 year storm
Subarea runoff =      2.378(CFS) for      4.850(Ac.)
Total runoff =     36.346(CFS)       Total area =      54.510(Ac.)
End of computations, total study area =           54.51 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.550
Area averaged RI index number =  65.7
```

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

Appendix 8

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section **H** of the 20**18** SMR WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table H.1 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ A. **On-site storm drain inlets**	☑ **Locations of inlets.**	☑ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	☑ **Maintain and periodically repaint or replace inlet markings.** ☑ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ☑ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ☑ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
☐ B. **Interior floor drains and elevator shaft sump pumps**		☐ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**
☐ C. **Interior parking garages**		☐ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ D1. **Need for future indoor & structural pest control**		❑ **Note building design features that discourage entry of pests.**	❑ **Provide Integrated Pest Management information to owners, lessees, and operators.**
☑ D2. **Landscape/ Outdoor Pesticide Use**	☑ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ☑ **Show self-retaining landscape areas, if any.** ☑ **Show stormwater treatment and hydrograph modification management BMPs.**	**State that final landscape plans will accomplish all of the following.** ☑ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ☑ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ☑ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ❑ **Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	☑ **Maintain landscaping using minimum or no pesticides.** ☑ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at: http://www.rcwatershed.org/about/materials-library/#1450469138395-bb76dd39-d810 ☑ **Provide IPM information to new owners, lessees and operators.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ E. **Pools, spas, ponds, decorative fountains, and other water features.**	☑ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	☑ **See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at:** http://www.rcwatershed.org/about/materials-library/#1450469201433-f5f358c9-6008
❑ F. **Food service**	❑ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ❑ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	❑ **Describe the location and features of the designated cleaning area.** ❑ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.**	❑ **See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at** http://www.rcwatershed.org/about/materials-library/#1450389926766-61e8af0b-53a9 **Provide this brochure to new site owners, lessees, and operators.**
☑ G. **Refuse areas**	☑ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ☑ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ☑ **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	☑ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ☑ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	☑ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ H. **Industrial processes.**	❑ **Show process area.**	❑ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	❑ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at: **http://www.rcwatershed.org/about/materials-library/#1450389926766-61e8af0b-53a9**
❑ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	❑ **Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** **www.cchealth.org/groups/hazmat/**	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ J. **Vehicle and Equipment Cleaning**	❑ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	❑ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ❑ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at:** http://www.rcwatershed.org/about/materials-library/#1450389926766-61e8af0b-53a9 ❑ **Car dealerships and similar may rinse cars with water only.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ K. **Vehicle/Equipment Repair and Maintenance**	☑ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ❑ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ❑ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	☑ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ❑ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ❑ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ☑ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ☑ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ☑ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.** **Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations; "Outdoor Cleaning Activities;" and "Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants. Brochures can be found at: http://www.rcwatershed.org/about/materials-library/#1450389926766-61e8af0b-53a9**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ L. **Fuel Dispensing Areas**	❑ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ❑ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		❑ **The property owner shall dry sweep the fueling area routinely.** ❑ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

[6] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ M. **Loading Docks**	❑ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ❑ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ❑ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		❑ **Move loaded and unloaded items indoors as soon as possible.** ❑ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ N. **Fire Sprinkler Test Water**		☑ **Provide a means to drain fire sprinkler test water to the sanitary sewer.**	☑ **See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
O. **Miscellaneous Drain or Wash Water or Other Sources** ❑ **Boiler drain lines** ❑ **Condensate drain lines** ❑ **Rooftop equipment** ❑ **Drainage sumps** ☑ **Roofing, gutters, and trim.** ❑ **Other sources**		❑ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ❑ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ❑ **Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ❑ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ☑ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.** ❑ **Include controls for other sources as specified by local reviewer.**	

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ P. **Plazas, sidewalks, and parking lots.**			❑ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.**

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

RECORDING REQUESTED BY:

CITY OF MENIFEE

AND WHEN RECORDED MAIL TO:

CITY OF MENIFEE
CITY CLERK
29844 HAUN ROAD
MENIFEE, CA 92586-6540

SPACE ABOVE THIS LINE FOR RECORDER'S USE

WATER QUALITY MANAGEMENT PLAN AND STORMWATER BEST MANAGEMENT PRACTICES OPERATION, TRANSFER, MAINTENANCE AND RIGHT OF ENTRY AGREEMENT

PROJECT NAME: _____

PROPERTY OWNER NAME: _____

PROPERTY ADDRESS: _____

_____

APN: _____

THIS AGREEMENT is made and entered into in

_____, California, this _____ day of

_____, 202___, by and between

_____, herein after

referred to as "Owner", and the CITY OF MENIFEE, a municipal corporation, located in the County of Riverside, State of California hereinafter referred to as "CITY";

WHEREAS, the City is a Co-Permittee for discharging stormwater from its MS4 facilities pursuant to the Santa Ana Regional Water Quality Control Board Order No. R8-2010-0033, MS4 NPDES Permit No. CAS 618033. Under the terms of the permit the City is required to enforce the provisions of the permit within its jurisdiction. The requirements contained in this agreement are intended to achieve the goals of the MS4 permit;

WHEREAS, the Owner owns real property ("Property) in the City of Menifee, County of Riverside, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of which exhibits is attached hereto and incorporated herein by this reference;

WHEREAS, at the time of initial approval of development project known as:

_____ within the Property described herein, the City required the project to employ Best Management Practices, hereinafter referred to as "BMPs," to minimize pollutants in urban runoff;

WHEREAS, the Owner has chosen to install and/or implement BMPs as described in the Water Quality Management Plan, on file with the City, hereinafter referred to as "WQMP," to minimize pollutants in urban runoff and to minimize other adverse impacts of urban runoff;

WHEREAS, said WQMP has been certified by the Owner and reviewed and accepted by the City;

WHEREAS, said BMPs, with installation and/or implementation on private property and draining only private property, are part of a private facility with all maintenance or replacement, therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of all BMPs in the WQMP and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1. Right of Access: Owner hereby provides the City of Menifee designee complete access, of any duration, to the BMPs and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by the City's Engineer, no advance notice, for the purpose of inspection, sampling, testing of the Device, and in case of emergency to direct all necessary repairs or other preventative measures at owner's expense in accordance with the procedures set forth in paragraph 3 below. City shall make every effort at all times to minimize or avoid interference with Owner's use of the Property.

2. Responsibility for Operation and Maintenance of BMPs: Owner shall use its best efforts diligently to maintain all BMPs in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of any material(s) from the BMPs and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the City, the Owner shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination.

3. City Maintenance at Owner's Expense: In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this

Agreement, the City may cause such maintenance to be conducted on Owner's Property at Owner's expense if Owner does not commence and diligently work to perform the maintenance within five (5) days of receiving written notice from the City, in accordance with paragraph 10 below, of Owner's failure to comply with the terms of this Agreement. The City may charge the entire cost and expense of any maintenance undertaken by the City, whether performed as a response to an emergency situation or following five (5) day written notice by the City, to the Owner or Owner's successors or assigns, including administrative costs, attorney's fees and interest thereon at the maximum rate authorized by the Civil Code from the Date of the notice of expense until paid in full. The City, at its sole election, may take these costs to be a lien upon the property that may be collected at the same time and in the same manner as ordinary municipal taxes as provided in Government Code section 38773.5. Nothing in this section or this Agreement creates an obligation by the City to maintain or repair any BMP, nor does this section prohibit the City from pursuing other legal recourse against Owner.

4. Surety Bond: The City may require the owner to post security in form and for a time period satisfactory to the City to guarantee the performance of the obligations stated herein. Should the Owner fail to perform the obligations under the Agreement, the City may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement. As an additional remedy, the City's Engineer may withdraw any previous stormwater-related approval with respect to the property on which BMPs have been installed and/or implemented until such time as Owner repays to City its reasonable costs incurred in accordance with paragraph 3 above.

5. Recording: This agreement shall be recorded in the Office of the Recorder of Riverside County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the City, including interest as herein above set forth, subject to foreclosure in event of default in payment.

6. Attorney's Fees: In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to pay all costs incurred by the City in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.

7. Covenant: It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.

8. Binding on Successors: The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the City at the same time such notice is provided to the successor.

9. Time of the Essence: Time is of the essence in the performance of this Agreement.

10. Notice: Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

IF TO CITY:

City of Menifee

29844 Haun Road

Menifee, CA 92586-6540

IF TO OWNER:

_____

_____

_____

_____

CITY:

By:_____
Armando G. Villa,
City Manager

APPROVED AS TO FORM:

_____
Jeffery T. Melching, City Attorney

ATTEST:

_____
Sarah Manwaring, City Clerk

OWNER:

By:_____
NAME

Title:_____

OWNER:

By:_____
NAME

Title:_____

NOTARY ACKNOWLEDGEMENTS ON FOLLOWING PAGE

EXHIBIT "A"

To

COVENANT AND AGREEMENT REGARDING WATER QUALITY MANAGEMENT PLAN BMP, CONSENT TO INSPECT, MAINTENANCE AND INDEMNIFICATION

For

PORTIONS OF: APN'S 360-300-002; 360-300-003; 360-300-004; 360-300-005; 360-300-006; 360-300-009; 360-350-001,

Menifee, CA

All that real property located in the City of Menifee, County of Riverside, California, described as follows:

Being a subdivision of a portion of the west half of the northwest quarter of section 15, township 6 south, range 3 west, San Bernardino meridian, together with portions of parcels 2, 3, 5, 6, 8 and lots "b" through and "f", inclusive, of parcel map no. 8433, filed in book 38, page 33 of parcel maps in the office of the Riverside County Recorder, California, lying within sections 15 and 16, township 6 south, range 3 west, San Bernardino meridian

04/16/2021

Brian R. Lowell Date

RCE 74550

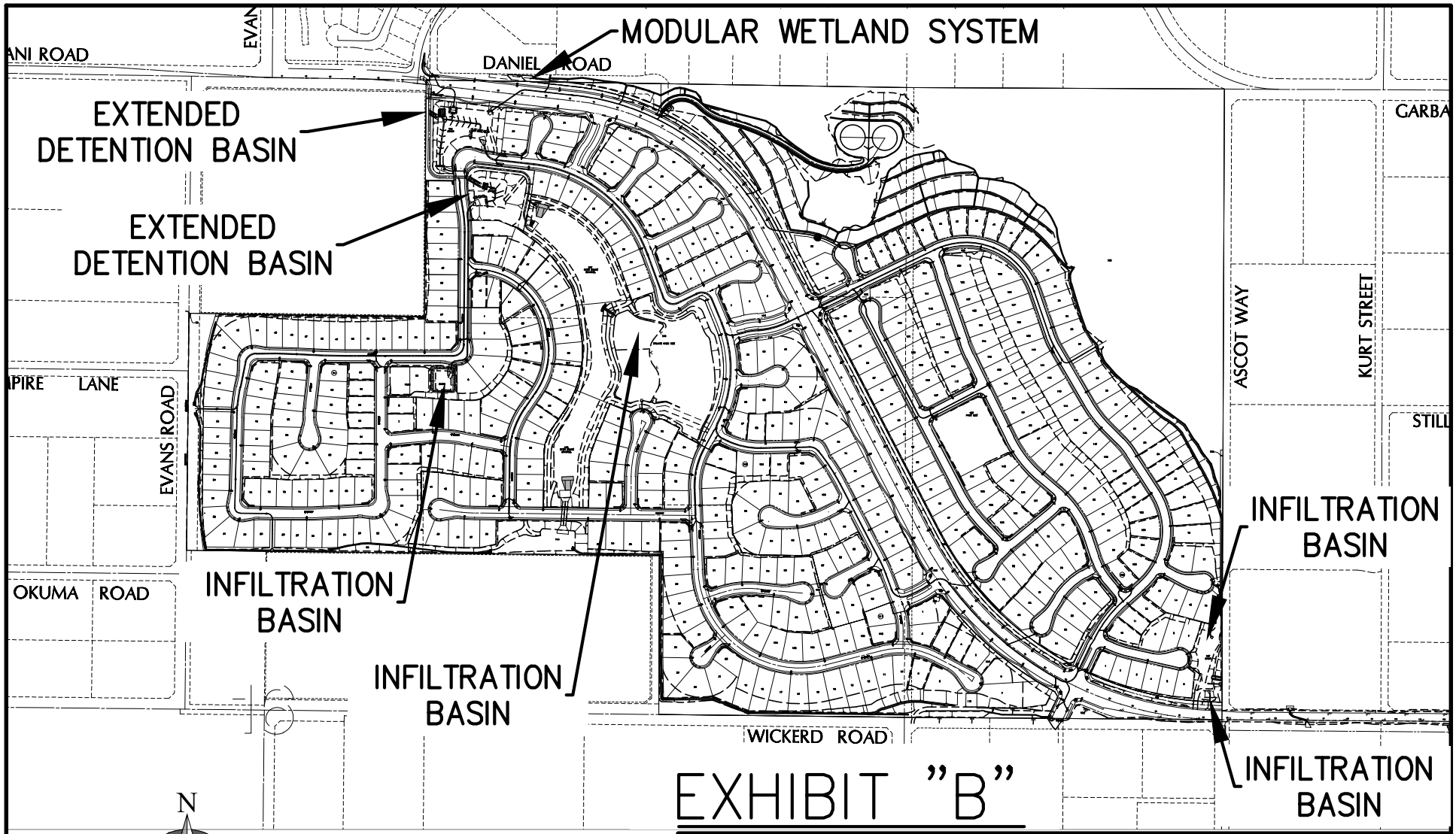


EXHIBIT "B"

N
W HUNSAKER E
S

0 300 600 1200

SCALE: 1" = 600'

BRIAN R. LOWELL
RCE 74550

CITY OF MENIFEE, COUNTY OF RIVERSIDE
BIOFILTRATION - MODULAR WETLAND SYSTEM

PREPARED BY	CHECKED BY	DATE	SHEET 1 OF 1
C. ERICKSON	B. LOWELL	4/16/2021	

H&A
HUNSAKER & ASSOCIATES
IRVINE, INC
INLAND EMPIRE REGION
2900 ADAMS STREET, SUITE A-15
RIVERSIDE CA 92504 (951)352-7200
PLANNING/ENGINEERING/SURVEYING/GOVERNMENT RELATIONS

W.O.: -

SCALE: 1" = 600'

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

3.1 INFILTRATION BASIN

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evapotranspiration (when vegetated), Evaporation, and Sedimentation
Maximum Treatment Area	50 acres
Other Names	Bioinfiltration Basin

Description

An Infiltration Basin is a flat earthen basin designed to capture the design capture volume, V_{BMP}. The stormwater infiltrates through the bottom of the basin into the underlying soil over a 72 hour drawdown period. Flows exceeding V_{BMP} must discharge to a downstream conveyance system. Trash and sediment accumulate within the forebay as stormwater passes into the basin. Infiltration basins are highly effective in removing all targeted pollutants from stormwater runoff.

Figure 1 – Infiltration Basin

See Appendix A, and Appendix C, Section 1 of *Basin Guidelines*, for additional requirements.

Siting Considerations

The use of infiltration basins may be restricted by concerns over ground water contamination, soil permeability, and clogging at the site. See the applicable WQMP for any specific feasibility considerations for using infiltration BMPs. Where this BMP is being used, the soil beneath the basin must be thoroughly evaluated in a geotechnical report since the underlying soils are critical to the basin's long term performance. To protect the basin from erosion, the sides and bottom of the basin must be vegetated, preferably with native or low water use plant species.

In addition, these basins may not be appropriate for the following site conditions:

- Industrial sites or locations where spills of toxic materials may occur
- Sites with very low soil infiltration rates
- Sites with high groundwater tables or excessively high soil infiltration rates, where pollutants can affect ground water quality
- Sites with unstabilized soil or construction activity upstream
- On steeply sloping terrain
- Infiltration basins located in a fill condition should refer to Appendix A of this Handbook for details on special requirements/restrictions

Setbacks

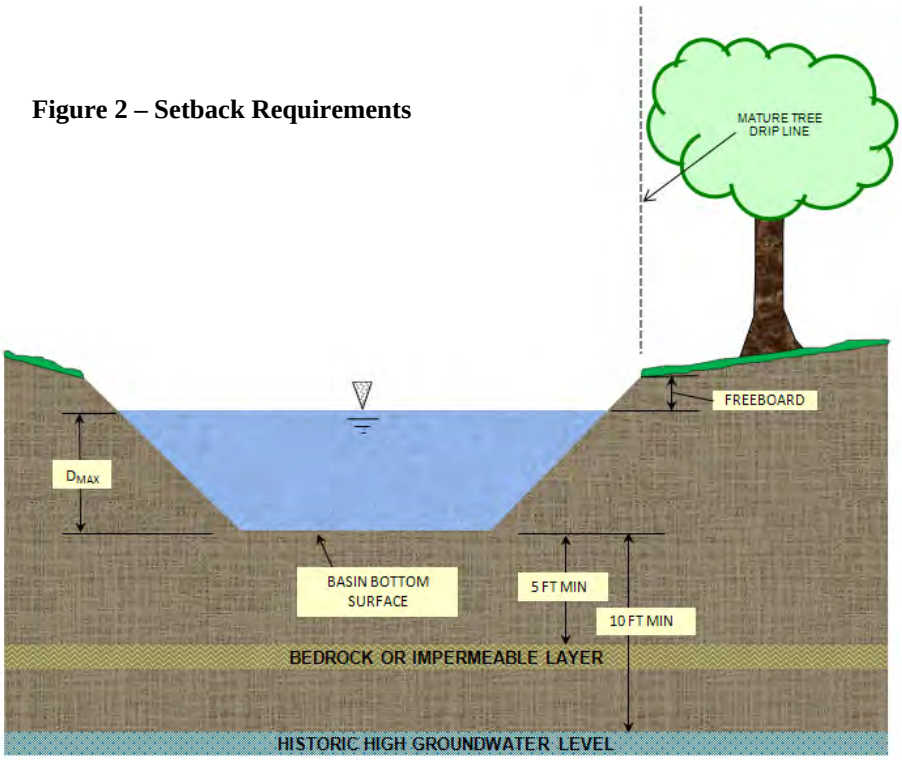
Always consult your geotechnical engineer for site specific recommendations regarding setbacks for infiltration trenches. Recommended setbacks are needed to protect buildings, existing trees, walls, onsite or nearby wells, streams, and tanks. Setbacks should be considered early in the design process since they can affect where infiltration facilities may be placed and how deep they are allowed to be. For instance, depth setbacks can dictate fairly shallow facilities that will have a larger footprint and, in some cases, may make an infiltration basin infeasible. In that instance, another BMP must be selected.

Infiltration basins typically must be set back:

- 10 feet from the historic high groundwater (measured vertically from the bottom of the basin, as shown in Figure 2)
- 5 feet from bedrock or impermeable surface layer (measured vertically from the bottom of the basin, as shown in Figure 2)
- From all existing mature tree drip lines as indicated in Figure 2 (to protect their root structure)
- 100 feet horizontally from wells, tanks or springs

Setbacks to walls and foundations must be included as part of the Geotechnical Report. All other setbacks shall be in accordance with applicable standards of the District's *Basin Guidelines* (Appendix C).

Figure 2 – Setback Requirements



Forebay

A concrete forebay shall be provided to reduce sediment clogging and to reduce erosion. The forebay shall have a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall / berm. Full height notch-type weir(s), offset from the line of flow from the basin inlet to prevent short circuiting, shall be used to outlet the forebay. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

Overflow

Flows exceeding V_{BMP} must discharge to an acceptable downstream conveyance system. Where an adequate outlet is present, an overflow structure may be used. Where an embankment is present, an emergency spillway may be used instead. Overflows must be placed just above the design water surface for V_{BMP} and be near the outlet of the system. The overflow structure shall be similar to the District's Standard Drawing CB 110. Additional details may be found in the District's *Basin Guidelines* (Appendix C).

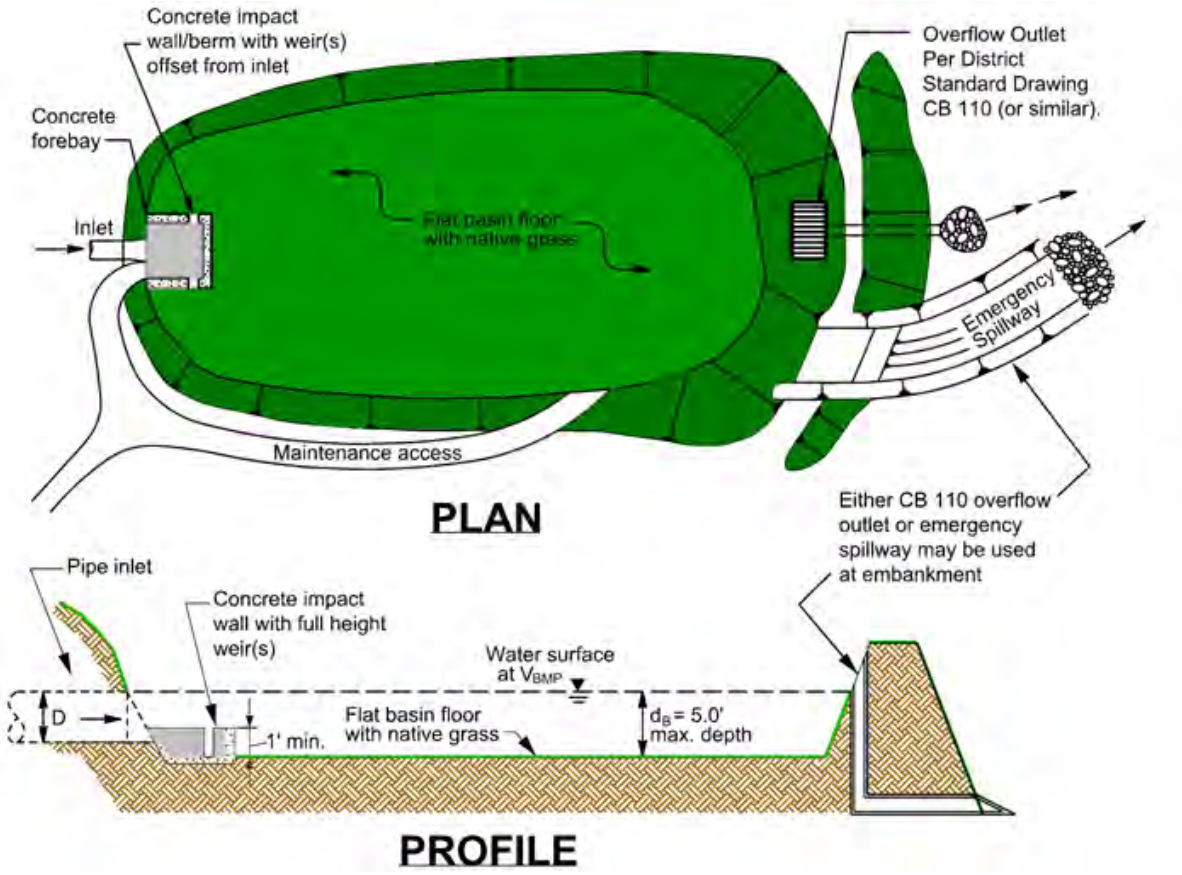


Figure 3 – Infiltration Basin

Landscaping Requirements

Basin vegetation provides erosion protection, improves sediment removal and assists in allowing infiltration to occur. The basin surface and side slopes shall be planted with native grasses. Proper landscape management is also required to ensure that the vegetation does not contribute to water pollution through pesticides, herbicides, or fertilizers. Landscaping shall be in accordance with County of Riverside Ordinance 859 and the District's *Basin Guidelines* (Appendix C), or other guidelines issued by the Engineering Authority.

Maintenance

Normal maintenance of an infiltration basin includes the maintenance of landscaping, debris and trash removal from the surface of the basin, and tending to problems associated with standing water (vectors, odors, etc.). Significant ponding, especially more than 72 hours after an event, may indicate that the basin surface is no longer providing sufficient infiltration and requires aeration. See the District's *Basin Guidelines* (Appendix C) for additional requirements (i.e., fencing, maintenance access, etc.).

Table 1 - Inspection and Maintenance

Schedule	Inspection and Maintenance Activity
Ongoing including just before annual storm seasons and following rainfall events.	• Maintain vegetation as needed. Use of fertilizers, pesticides and herbicides should be strenuously avoided to ensure they don't contribute to water pollution. If appropriate native plant selections and other IPM methods are used, such products shouldn't be needed. If such projects are used, o Products shall be applied in accordance with their labeling, especially in relation to application to water, and in areas subjected to flooding. o Fertilizers should not be applied within 15 days before, after, or during the rain season. • Remove debris and litter from the entire basin to minimize clogging and improve aesthetics. • Check for obvious problems and repair as needed. Address odor, insects, and overgrowth issues associated with stagnant or standing water in the basin bottom. There should be no long-term ponding water. • Check for erosion and sediment laden areas in the basin. Repair as needed. Clean forebay if needed. • Revegetate side slopes where needed.
Annually. If possible, schedule these inspections within 72 hours after a significant rainfall.	• Inspection of hydraulic and structural facilities. Examine the inlet for blockage, the embankment and spillway integrity, as well as damage to any structural element. • Check for erosion, slumping and overgrowth. Repair as needed. • Check basin depth for sediment build up and reduced total capacity. Scrape bottom as needed and remove sediment. Restore to original cross-section and infiltration rate. Replant basin vegetation. • Verify the basin bottom is allowing acceptable infiltration. Use a disc or other method to aerate basin bottom only if there is actual significant loss of infiltrative capacity, rather than on a routine basis[1]. • No water should be present 72 hours after an event. No long term standing water should be present at all. No algae formation should be visible. Correct problem as needed.

1. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**

Table 2 - Design and Sizing Criteria for Infiltration Basins

Design Parameter	Infiltration Basin
Design Volume	V_{BMP}
Forebay Volume	0.5% V_{BMP}
Drawdown time (maximum)	72 hours
Maximum tributary area	50 acres [2]
Minimum infiltration rate	Must be sufficient to drain the basin within the required Drawdown time over the life of the BMP. The WQMP may include specific requirements for minimum tested infiltration rates.
Maximum Depth	5 feet
Spillway erosion control	Energy dissipators to reduce velocities[1]
Basin Slope	0%
Freeboard (minimum)	1 foot [1]
Historic High Groundwater Setback (max)	10 feet
Bedrock/impermeable layer setback (max)	5 feet
Tree setbacks	Mature tree drip line must not overhang the basin
Set back from wells, tanks or springs	100 feet
Set back from foundations	As recommended in Geotechnical Report

1. **Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures**
2. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**

Note: The information contained in this BMP Factsheet is intended to be a summary of design considerations and requirements. Additional information which applies to all detention basins may be found in the District's Basin Guidelines (Appendix C). In addition, information herein may be superseded by other guidelines issued by the co-permittee.

INFILTRATION BASIN SIZING PROCEDURE

1. Find the Design Volume, V_{BMP}.
   a) Enter the Tributary Area, $A_{T.}$
   b) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.
2. Determine the Maximum Depth.
   a) Enter the infiltration rate. The infiltration rate shall be established as described in Appendix A: "Infiltration Testing".
   b) Enter the design Factor of Safety from Table 1 in Appendix A: "Infiltration Testing".
   c) The spreadsheet will determine D_1, the maximum allowable depth of the basin based on the infiltration rate along with the maximum drawdown time (72 hours) and the Factor of Safety.

$$D_1 = [(t) \times (I)] / 12s$$

Where I = site infiltration rate (in/hr)
s = safety factor
t = drawdown time (maximum 72 hours)

d) Enter the depth of freeboard.

e) Enter the depth to the historic high groundwater level measured from the top of the basin.

f) Enter the depth to the top of bedrock or other impermeable layer measured from the finished grade.

g) The spreadsheet will determine D_2, the total basin depth (including freeboard, if used) of the basin, based on restrictions to the depth by groundwater and an impermeable layer.

D_2 = Depth to groundwater – (10 + freeboard) (ft);

or

D_2 = Depth to impermeable layer – (5 + freeboard) (ft)

Whichever is least.

h) The spreadsheet will determine the maximum allowable effective depth of basin, D_{MAX}, based on the smallest value between D_1 and D_2. D_{MAX} is the maximum depth of water only and does not include freeboard. D_{MAX} shall not exceed 5 feet.

3. Basin Geometry

a) Enter the basin side slopes, z (no steeper than 4:1).

b) Enter the proposed basin depth, d_B excluding freeboard.

c) The spreadsheet will determine the minimum required surface area of the basin:

$$A_s = V_{BMP} / d_B$$

Where A_s = minimum area required (ft^2)
V_{BMP} = volume of the infiltration basin (ft^3)
d_B= proposed depth not to exceed maximum allowable depth, D_{MAX} (ft)

d) Enter the proposed bottom surface area. This area shall not be less than the minimum required surface area.

4. Forebay

A concrete forebay with a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall shall be provided. Full-height rectangular weir(s) shall be used to outlet the forebay. The weir(s) must be offset from the line of flow from the basin inlet. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

a) The spreadsheet will determine the minimum required forebay volume based on 0.5% V_{BMP}.

b) Enter the proposed depth of the forebay berm/splashwall (1foot minimum).

c) The spreadsheet will determine the minimum required forebay surface area.

d) Enter the width of rectangular weir to be used (minimum 1.5 inches). Weir width should be established based on a 5 minute drawdown time.

Infiltration Basin TC-11

Design Considerations

- Soil for Infiltration
- Slope
- Aesthetics

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually exfiltrates through the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

California Experience

Infiltration basins have a long history of use in California, especially in the Central Valley. Basins located in Fresno were among those initially evaluated in the National Urban Runoff Program and were found to be effective at reducing the volume of runoff, while posing little long-term threat to groundwater quality (EPA, 1983; Schroeder, 1995). Proper siting of these devices is crucial as underscored by the experience of Caltrans in siting two basins in Southern California. The basin with marginal separation from groundwater and soil permeability failed immediately and could never be rehabilitated.

Advantages

- Provides 100% reduction in the load discharged to surface waters.
- The principal benefit of infiltration basins is the approximation of pre-development hydrology during which a

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

significant portion of the average annual rainfall runoff is infiltrated and evaporated rather than flushed directly to creeks.

- If the water quality volume is adequately sized, infiltration basins can be useful for providing control of channel forming (erosion) and high frequency (generally less than the 2-year) flood events.

Limitations

- May not be appropriate for industrial sites or locations where spills may occur.
- Infiltration basins require a minimum soil infiltration rate of 0.5 inches/hour, not appropriate at sites with Hydrologic Soil Types C and D.
- If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated prior to infiltration to protect groundwater quality.
- Not suitable on fill sites or steep slopes.
- Risk of groundwater contamination in very coarse soils.
- Upstream drainage area must be completely stabilized before construction.
- Difficult to restore functioning of infiltration basins once clogged.

Design and Sizing Guidelines

- Water quality volume determined by local requirements or sized so that 85% of the annual runoff volume is captured.
- Basin sized so that the entire water quality volume is infiltrated within 48 hours.
- Vegetation establishment on the basin floor may help reduce the clogging rate.

Construction/Inspection Considerations

- Before construction begins, stabilize the entire area draining to the facility. If impossible, place a diversion berm around the perimeter of the infiltration site to prevent sediment entrance during construction or remove the top 2 inches of soil after the site is stabililized. Stabilize the entire contributing drainage area, including the side slopes, before allowing any runoff to enter once construction is complete.
- Place excavated material such that it can not be washed back into the basin if a storm occurs during construction of the facility.
- Build the basin without driving heavy equipment over the infiltration surface. Any equipment driven on the surface should have extra-wide ("low pressure") tires. Prior to any construction, rope off the infiltration area to stop entrance by unwanted equipment.
- After final grading, till the infiltration surface deeply.
- Use appropriate erosion control seed mix for the specific project and location.

Performance

As water migrates through porous soil and rock, pollutant attenuation mechanisms include precipitation, sorption, physical filtration, and bacterial degradation. If functioning properly, this approach is presumed to have high removal efficiencies for particulate pollutants and moderate removal of soluble pollutants. Actual pollutant removal in the subsurface would be expected to vary depending upon site-specific soil types. This technology eliminates discharge to surface waters except for the very largest storms; consequently, complete removal of all stormwater constituents can be assumed.

There remain some concerns about the potential for groundwater contamination despite the findings of the NURP and Nightingale (1975; 1987a,b,c; 1989). For instance, a report by Pitt et al. (1994) highlighted the potential for groundwater contamination from intentional and unintentional stormwater infiltration. That report recommends that infiltration facilities not be sited in areas where high concentrations are present or where there is a potential for spills of toxic material. Conversely, Schroeder (1995) reported that there was no evidence of groundwater impacts from an infiltration basin serving a large industrial catchment in Fresno, CA.

Siting Criteria

The key element in siting infiltration basins is identifying sites with appropriate soil and hydrogeologic properties, which is critical for long term performance. In one study conducted in Prince George's County, Maryland (Galli, 1992), all of the infiltration basins investigated clogged within 2 years. It is believed that these failures were for the most part due to allowing infiltration at sites with rates of less than 0.5 in/hr, basing siting on soil type rather than field infiltration tests, and poor construction practices that resulted in soil compaction of the basin invert.

A study of 23 infiltration basins in the Pacific Northwest showed better long-term performance in an area with highly permeable soils (Hilding, 1996). In this study, few of the infiltration basins had failed after 10 years. Consequently, the following guidelines for identifying appropriate soil and subsurface conditions should be rigorously adhered to.

- Determine soil type (consider RCS soil type 'A, B or C' only) from mapping and consult USDA soil survey tables to review other parameters such as the amount of silt and clay, presence of a restrictive layer or seasonal high water table, and estimated permeability. The soil should not have more than 30% clay or more than 40% of clay and silt combined. Eliminate sites that are clearly unsuitable for infiltration.

- Groundwater separation should be at least 3 m from the basin invert to the measured ground water elevation. There is concern at the state and regional levels of the impact on groundwater quality from infiltrated runoff, especially when the separation between groundwater and the surface is small.

- Location away from buildings, slopes and highway pavement (greater than 6 m) and wells and bridge structures (greater than 30 m). Sites constructed of fill, having a base flow or with a slope greater than 15% should not be considered.

- Ensure that adequate head is available to operate flow splitter structures (to allow the basin to be offline) without ponding in the splitter structure or creating backwater upstream of the splitter.

- Base flow should not be present in the tributary watershed.

Secondary Screening Based on Site Geotechnical Investigation

- At least three in-hole conductivity tests shall be performed using USBR 7300-89 or Bouwer-Rice procedures (the latter if groundwater is encountered within the boring), two tests at different locations within the proposed basin and the third down gradient by no more than approximately 10 m. The tests shall measure permeability in the side slopes and the bed within a depth of 3 m of the invert.

- The minimum acceptable hydraulic conductivity as measured in any of the three required test holes is 13 mm/hr. If any test hole shows less than the minimum value, the site should be disqualified from further consideration.

- Exclude from consideration sites constructed in fill or partially in fill unless no silts or clays are present in the soil boring. Fill tends to be compacted, with clays in a dispersed rather than flocculated state, greatly reducing permeability.

- The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Additional Design Guidelines

(1) Basin Sizing - The required water quality volume is determined by local regulations or sufficient to capture 85% of the annual runoff.

(2) Provide pretreatment if sediment loading is a maintenance concern for the basin.

(3) Include energy dissipation in the inlet design for the basins. Avoid designs that include a permanent pool to reduce opportunity for standing water and associated vector problems.

(4) Basin invert area should be determined by the equation:

$$A = \frac{WQV}{kt}$$

where A = Basin invert area (m^2)

WQV = water quality volume (m^3)

k = 0.5 times the lowest field-measured hydraulic conductivity (m/hr)

t = drawdown time (48 hr)

(5) The use of vertical piping, either for distribution or infiltration enhancement shall not be allowed to avoid device classification as a Class V injection well per 40 CFR146.5(e)(4).

Maintenance

Regular maintenance is critical to the successful operation of infiltration basins. Recommended operation and maintenance guidelines include:

- Inspections and maintenance to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.
- Observe drain time for the design storm after completion or modification of the facility to confirm that the desired drain time has been obtained.
- Schedule semiannual inspections for beginning and end of the wet season to identify potential problems such as erosion of the basin side slopes and invert, standing water, trash and debris, and sediment accumulation.
- Remove accumulated trash and debris in the basin at the start and end of the wet season.
- Inspect for standing water at the end of the wet season.
- Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.
- Remove accumulated sediment and regrade when the accumulated sediment volume exceeds 10% of the basin.
- If erosion is occurring within the basin, revegetate immediately and stabilize with an erosion control mulch or mat until vegetation cover is established.
- To avoid reversing soil development, scarification or other disturbance should only be performed when there are actual signs of clogging, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a very light tractor.

Cost

Infiltration basins are relatively cost-effective practices because little infrastructure is needed when constructing them. One study estimated the total construction cost at about $2 per ft (adjusted for inflation) of storage for a 0.25-acre basin (SWRPC, 1991). As with other BMPs, these published cost estimates may deviate greatly from what might be incurred at a specific site. For instance, Caltrans spent about $18/ft^3 for the two infiltration basins constructed in southern California, each of which had a water quality volume of about 0.34 ac.-ft. Much of the higher cost can be attributed to changes in the storm drain system necessary to route the runoff to the basin locations.

Infiltration basins typically consume about 2 to 3% of the site draining to them, which is relatively small. Additional space may be required for buffer, landscaping, access road, and fencing. Maintenance costs are estimated at 5 to 10% of construction costs.

One cost concern associated with infiltration practices is the maintenance burden and longevity. If improperly maintained, infiltration basins have a high failure rate. Thus, it may be necessary to replace the basin with a different technology after a relatively short period of time.

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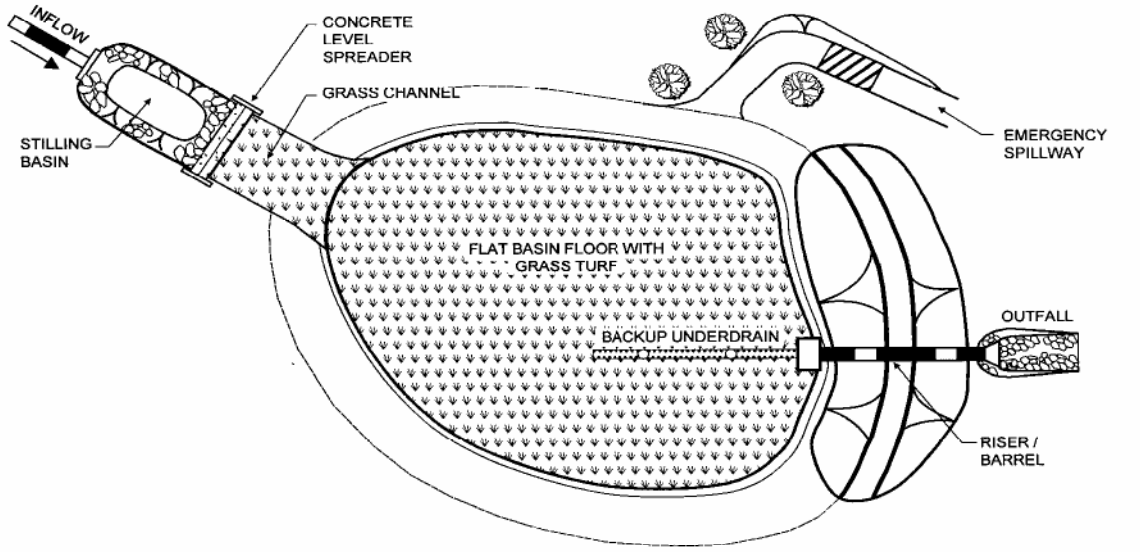
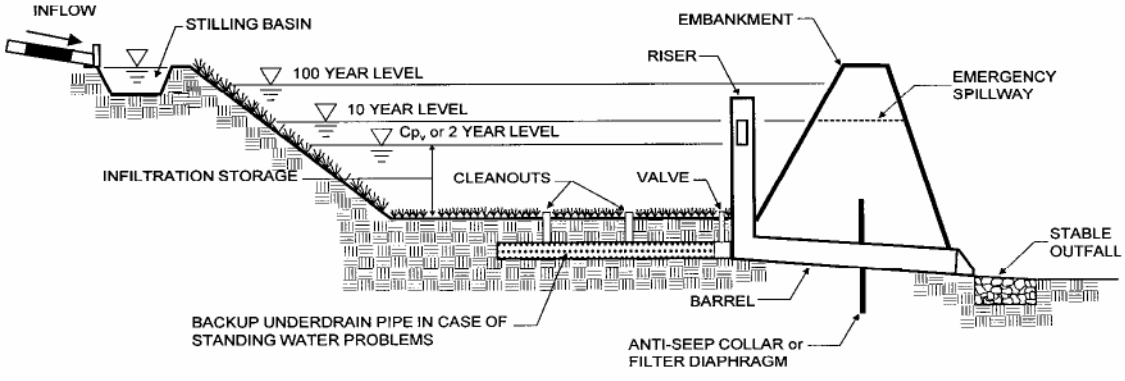
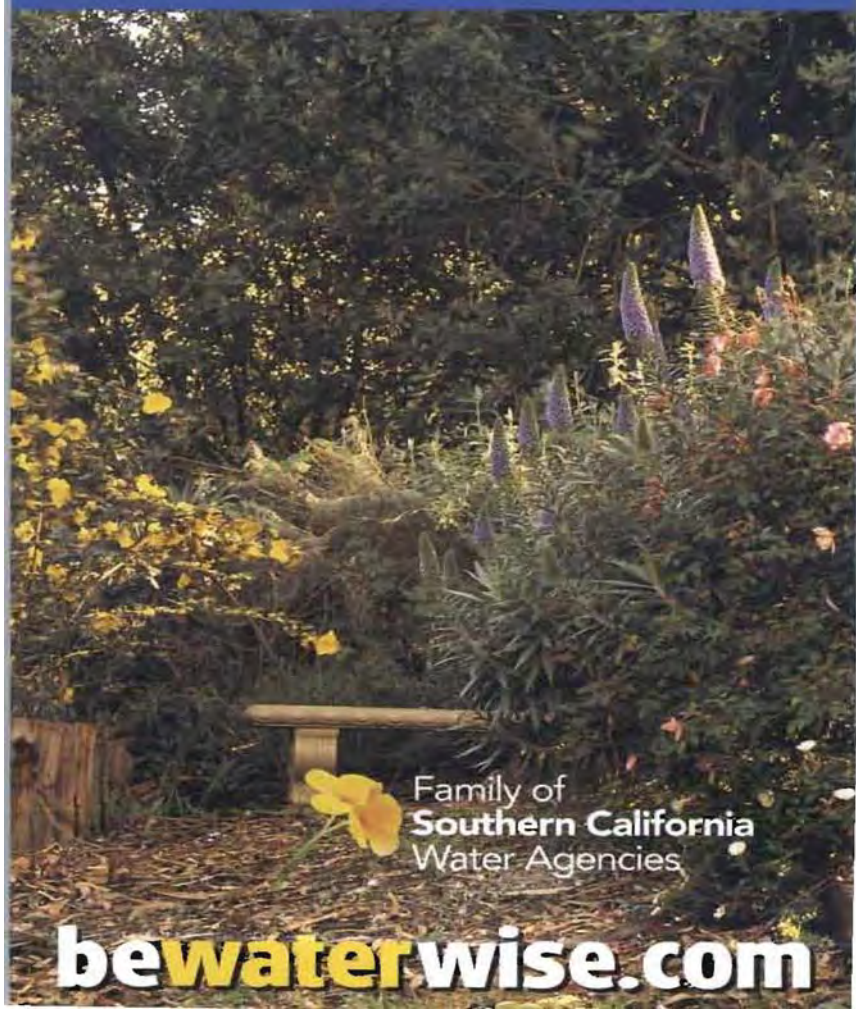


PLAN VIEW



PROFILE

10 Ways to Save Water Outdoors



TIP #1 The average homeowner uses twice the amount of water needed to keep plants healthy. Use the watering calculator and index at **bewaterwise.com** to know exactly how much water your plants need.

TIP #2 Check your sprinkler system for leaks, overspray and broken sprinkler heads. Update with drip or other more water-efficient sprinklers where appropriate.

TIP #3 This fall, plant a portion of your garden with beautiful native and California Friendly plants. Browse the plant database at **bewaterwise.com** to find just the right look for your outdoor spaces.

TIP #4 Reduce the amount of water-thirsty grass. Keep only what you need and replace the rest with less-thirsty plants or permeable paving.

TIP #5 For the grass you keep, set your lawnmower blade higher.

TIP #6 Adjust your sprinkler timer downward in September. Plants need less water when days are shorter.

TIP #7 Use a broom instead of the hose for cleaning sidewalks and patios.

TIP #8 Mulch! A layer of bark, gravel, compost, sawdust or low-growing groundcover evens out soil temperature and allows better water retention.

TIP #9 Check the list of invasive plants that hurt our environment at **caleppc.org** and remove any from your garden.

TIP #10 Share these tips with your gardener, neighbors and friends. Water conservation should be a part of every Southern Californian's lifestyle, but that doesn't mean we can't have lush and beautiful outdoor spaces.

bewaterwise.com

After the Storm

A Citizen's Guide to Understanding Stormwater

EPA 833-B-03-002

January 2003

Internet Address (URL) • HTTP://www.epa.gov
Recycled/Recyclable • Printed With Vegetable Oil Based Inks on 100% Postconsumer, Process Chlorine Free Recycled Paper

For more information contact:

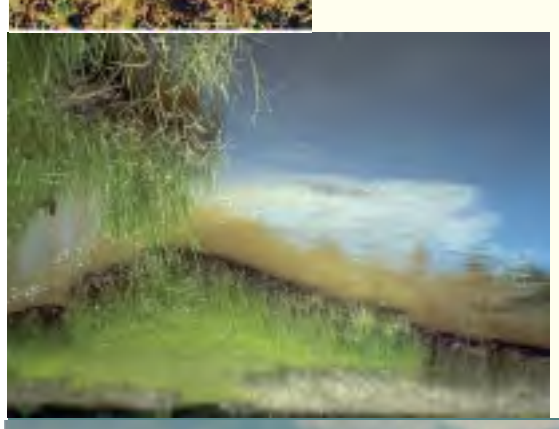
or visit
www.epa.gov/npdes/stormwater
www.epa.gov/nps

Why is stormwater runoff a problem?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

The effects of pollution



Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

Stormwater Pollution Solutions

Residential

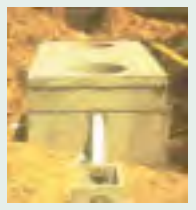
Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

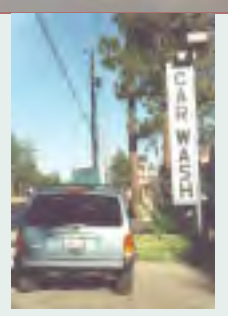
Septic systems



Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Auto care



Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

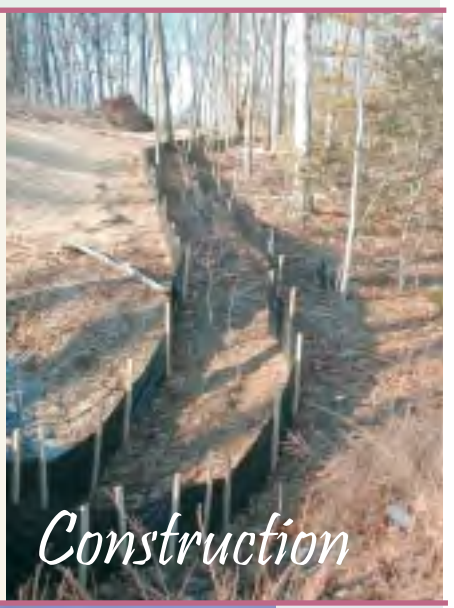
Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

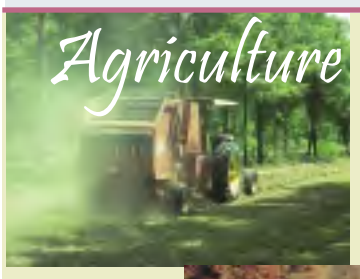
- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.



Construction

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

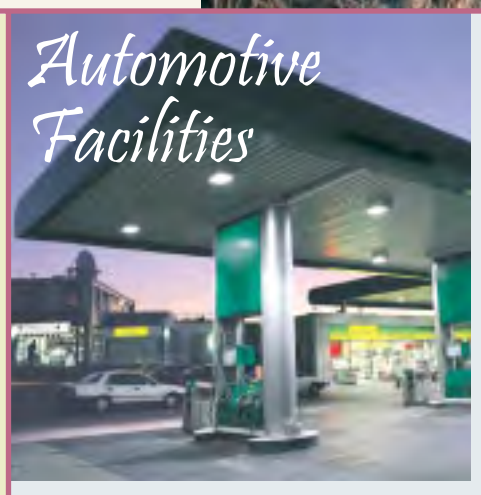
- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.



Agriculture

Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.



Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.

For Information:

For information on “closed-loop” suppliers and recycling/disposal vendors, contact:
County of Riverside
Health Services Agency
Department of Environmental Health
at (909) 358-5055.

SPILL RESPONSE AGENCY:
HAZ-MAT: (909) 358-5055
AFTER 5:00 P.M.: (909) 358-5245 OR 911

RECYCLING AND HAZARDOUS WASTE DISPOSAL: (909) 358-5055

TO REPORT ILLEGAL DUMPING OR A CLOGGED STORM DRAIN: 1-800-506-2555

To order additional brochures or to obtain information on other pollution prevention activities, call: (909) 955-1111.

The Cities and County of Riverside
StormWater/CleanWater Protection Program
1-800-506-2555

StormWater CleanWater
PROTECTION PROGRAM

Riverside County gratefully acknowledges the Santa Clara Valley Nonpoint Source Pollution Control Program and the City of Los Angeles Stormwater Management Division for information provided in this brochure.

StormWater Pollution

What you should know for...

AUTOMOTIVE MAINTENANCE & CAR CARE

Best Management Practices (BMPS) for:

- Auto Body Shops
- Auto Repair Shops
- Car Dealerships
- Gas Stations
- Fleet Service Operations

StormWater Pollution . . . What You Should Know

Riverside County has two drainage systems - sanitary sewers and storm drains. The storm drain system is designed to help prevent flooding by carrying excess rainwater away from streets. Since the storm drain system does not provide for water treatment, it also serves the *unintended* function of transporting pollutants directly to our waterways.

Unlike sanitary sewers, storm drains are not connected to a treatment plant - they flow directly to our local streams, rivers and lakes.

Rain and water runoff from automotive shops and businesses can carry pollutant material into storm drains. Examples of pollutants include oil and grease from cars, copper and asbestos from worn brake linings, zinc from tires, and toxics from spilled fluids.

Stormwater pollution causes as much as 60% of our water pollution problem. It jeopardizes the quality of our waterways and poses a threat to groundwater resources if pollutants percolate through soil.

The Cities and County of Riverside StormWater/CleanWater Protection Program

Since preventing pollution is much easier, and less costly, than cleaning up “after the fact,” the Cities and County of Riverside StormWater/CleanWater Protection Program informs residents and businesses on pollution prevention activities such as the Best Management Practices (BMPs) described in this pamphlet.

The Cities and County of Riverside have adopted ordinances for stormwater management and discharge control. In accordance with state and federal law, these local stormwater ordinances **prohibit** the discharge of wastes into the storm drain system or local surface waters. This includes discharges containing oil, antifreeze, gasoline and other waste materials.

PLEASE NOTE: A common stormwater pollution problem associated with automotive shops and businesses is the hosing down of service bays, parking and other areas. Often, this activity flushes pollutants into the storm drain system. The discharges of pollutants is ***strictly prohibited*** by local ordinances and state and federal regulations.

Keep your shop in tune. Follow these Practices to help prevent stormwater pollution . . .

1. Changing Automotive Fluids

- Designate an area away from storm or sanitary drains to change automotive fluids.
- Collect, separate, and recycle motor oil, antifreeze, transmission fluid, and gear oil.
- Drain brake fluid and other non-recyclables into a proper container and handle as a hazardous waste.
- Use a radiator flushing fluid that can be recycled, and add it to the waste antifreeze.

2. Working on Transmissions, Engines, and Miscellaneous Repairs

- Keep a drip pan or a wide low-rimmed container under vehicles to catch fluids whenever you unclip hoses, unscrew filters, or change parts, to contain unexpected leaks.

3. Preventing Leaks and Spills

- Avoid spills by emptying and wiping drip pans when you move them to another vehicle or when they are half-full.
- Routinely check equipment to wipe up spills and repair leaks.
- Place large pans or an inflatable portable berm under wrecked cars.
- Drain all fluids from wrecked vehicles or "parts" cars you keep on site.

4. Cleaning up Spills

- Clean up small spills immediately using shop rags.

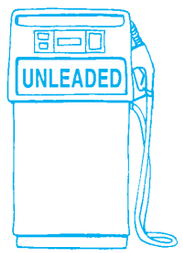
- Keep dry absorbent materials and/or a wet/dry vacuum cleaner on hand for mid-sized spills.
- Contain large spills immediately; block or shut off floor and parking lot drains and notify the authorities.
- Train employees to be familiar with hazardous spill response plans and emergency procedures.

5. Identify and Control Wastewater Discharges

- Ensure that shop sinks and floor drains are connected to the sanitary sewer. Check with the local sewer authority regarding permitting or other requirements.
- Post signs to prevent disposal of liquid wastes into sanitary drains.

6. Fueling Vehicles

- Clean-up minor spills, with a dry absorbent, rather than allowing them to evaporate. Dispose of the absorbent as a dry hazardous waste.
- Use a damp cloth and a damp mop to keep the area clean rather than a hose or a wet mop.

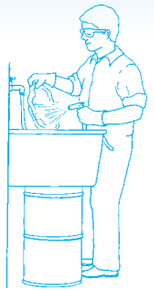


7. Removing and Storing Batteries

- Store batteries indoors, on an open rack.
- Return used batteries to a battery vendor.
- Contain cracked batteries to prevent hazardous spills.

8. Cleaning Parts

- Clean parts in a self-contained unit, solvent sink, or parts washer to prevent solvents and grease from entering a sewer or storm drain connection.



9. Metal Grinding and Finishing

- Catch metal filings in an enclosed unit or on a tarpaulin.
- Sweep filing area to prevent washing metals into floor drains.

10. Storing and Disposing of Waste

- Store recyclable and non-recyclable waste separately.
- Place liquid waste (hazardous or otherwise) within a bermed or secondary containment area.
- Cover outdoor storage areas to prevent contact with rain water.
- Collect used parts for delivery to a scrap metal dealer.

11. Selecting and Controlling Inventory

- Purchase recyclable or non-toxic materials.
- Select "closed-loop" suppliers and purchase supplies in bulk.

12. Outdoor Parking and Auto Maintenance

- Treat outdoor areas as an extension of your service bays or avoid using altogether.
- Sweep-up trash and dirt from outdoor parking and maintenance areas. Do not hose down areas. All non-storm water discharges are prohibited.
- Drain work areas to a sanitary drain rather than a storm drain. Contact the local sewer authority to determine if pretreatment is required.

13. Washing Vehicles, Cleaning Engines, and Other Steam Cleaning

- For occasional car exterior cleaning, minimize the water used and divert runoff to landscaped areas, keeping it out of the storm drain.
- Wash vehicles with biodegradable, phosphate-free detergent.
- Make sure no wastewater from engine or parts cleaning or steam cleaning is discharged where it may flow to a street, gutter, or storm drain.

14. Cleaning Work Areas

- Sweep or vacuum the shop floor frequently.
- Damp mop work areas - do not hose down work areas into the street or gutter.
- Do not pour mop water into the parking lot, street, gutter or storm drain.
- Use non-toxic cleaning products whenever possible.

Please remember:

Stormwater and the Construction Industry

Protect Natural Features

Bad

Good

- Minimize clearing.
- Minimize the amount of exposed soil.
- Identify and protect areas where existing vegetation, such as trees, will not be disturbed by construction activity.
- Protect streams, stream buffers, wild woodlands, wetlands, or other sensitive areas from any disturbance or construction activity by fencing or otherwise clearly marking these areas.

Construction Phasing

- Sequence construction activities so that the soil is not exposed for long periods of time.
- Schedule or limit grading to small areas.
- Install key sediment control practices before site grading begins.
- Schedule site stabilization activities, such as landscaping, to be completed immediately after the land has been graded to its final contour.

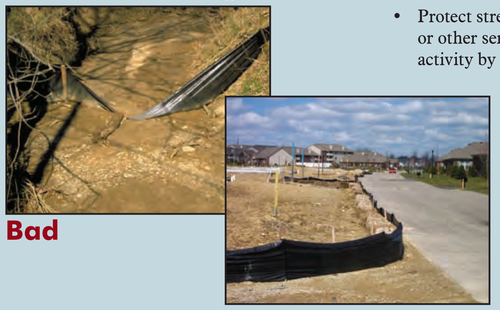
Vegetative Buffers

Bad

Good

- Protect and install vegetative buffers along waterbodies to slow and filter stormwater runoff.
- Maintain buffers by mowing or replanting periodically to ensure their effectiveness.

Silt Fencing



Bad

Good

- Inspect and maintain silt fences after each rainstorm.
- Make sure the bottom of the silt fence is buried in the ground.
- Securely attach the material to the stakes.
- Don't place silt fences in the middle of a waterway or use them as a check dam.
- Make sure stormwater is not flowing around the silt fence.

Maintain your BMPs!

IN RIVERSIDE COUNTY....Call 1-800-506-2555

TO REPORT ILLEGAL STORMDRAIN DISPOSAL

E-mail: Flood.fcnpdes@co.riverside.ca.us

Visit our website: www.floodcontrol.co.riverside.ca.us

Brought to you by the Storm Water/Clean Water Pollution Protection Program.....

REMEMBER, ONLY RAIN IN THE STORMDRAIN!

Site Stabilization

Bad

Good

- Vegetate, mulch, or otherwise stabilize all exposed areas as soon as land alterations have been completed.

Construction Entrances

Bad

Good

- Remove mud and dirt from the tires of construction vehicles before they enter a paved roadway.
- Properly size entrance BMPs for all anticipated vehicles.
- Make sure that the construction entrance does not become buried in soil.

Slopes

Bad

Good

- Rough grade or terrace slopes.
- Break up long slopes with sediment barriers, or under drain, or divert stormwater away from slopes.

Dirt Stockpiles

Bad

Good

- Cover or seed all dirt stockpiles.

Storm Drain Inlet Protection

Bad

Good

- Use rock or other appropriate material to cover the storm drain inlet to filter out trash and debris.
- Make sure the rock size is appropriate (usually 1 to 2 inches in diameter).
- If you use inlet filters, maintain them regularly.

www.epa.gov/npdes/menuofbmps

Stormwater and the Construction Industry

Planning and Implementing Erosion and Sediment Control Practices

The construction industry is a critical participant in the nation's efforts to protect streams, rivers, lakes, wetlands, and oceans. Through the use of best management practices (BMPs), construction site operators are the key defense against erosion and sedimentation.

As stormwater flows over a construction site, it picks up pollutants like sediment, debris, and chemicals. High volumes of stormwater can also cause stream bank erosion, and destroy downstream aquatic habitat. Preventing soil erosion and sedimentation is an important responsibility at all construction sites.

In addition to the environmental impact, uncontrolled erosion can have a significant financial impact on a construction project. It costs money and time to repair gullies, replace vegetation, clean sediment-clogged storm drains, replace poorly installed BMPs, and mitigate damage to other people's property or to natural resources.

Best Management Practice (BMP)
A BMP is a method used to prevent or control stormwater runoff and the discharge of pollutants, including sediment, into local waterbodies. Silt fences, inlet protection, and site-stabilization techniques are typical BMPs on a construction site.

Operator
An operator is someone who has control over and the ability to modify construction plans and specifications (e.g. owner, general contractor)

or

Someone who has control over the day-to-day operations at a site (e.g., owner, general contractor) that are necessary to ensure compliance with the permit requirements. It is the responsibility of a construction site owner or operator to contain stormwater runoff and prevent erosion during **all** stages of a project.

There may be more than one person at a site who meets these definitions and must apply for permit coverage. (States may have different definitions of the term "operator.")

So what's being done about polluted runoff?

The Clean Water Act includes the National Pollutant Discharge Elimination System (NPDES) permitting program. As of January 2003, 44 states and territories are authorized to issue NPDES stormwater permits. If your state isn't authorized to operate the NPDES stormwater permit program, EPA issues the permits. Permits vary from state to state, so contact your state or EPA for specific information. Your permitting authority has specific information on your state's NPDES stormwater permit program. In general, construction permits require construction operators to do all of the following:

- Develop and implement a stormwater pollution prevention plan
- Submit a permit application or notice of intent (NOI)
- Comply with the permit, including maintaining BMPs and inspecting the site

Under the NPDES program, construction activities that disturb 1 or more acres are required to obtain stormwater permit coverage. States have different names for the plans that construction operators must develop, such as

- Stormwater pollution prevention plan
- Erosion and sediment control plan
- Erosion control and stormwater management plan
- Stormwater management plan
- Water pollution control plan
- Pollution prevention plan

This document uses the term "*Plan*."

I think I need a permit... Where do I start?

All land-disturbing activities, including clearing, grading, and excavation, that disturb **1 or more acres** are required to be covered under a state or EPA-issued NPDES construction stormwater permit **prior to land disturbance**. Permit requirements vary by state. Begin by researching the specific requirements in your state. You might already be subject to local erosion and sediment control requirements, but that doesn't release you from the requirements of the NPDES program at the state or EPA level. Although you must comply with both sets of requirements, in most cases they have been designed to be complementary. Contact your permitting authority to find out exactly what you need to do. A good place to start your search is the Construction Industry Compliance Assistance web site at http://www.envcap.org/cica.

The NPDES permit requirements include small construction activities that are part of a larger common plan of development or sale, such as a single lot within a larger subdivision. For developments with multiple operators, all operators must have permit coverage for their individual parts of the larger development, no matter how large or small each operation happens to be. When there are multiple operators at one site, they're encouraged to develop and share one comprehensive Plan and obtain permit coverage as co-permitees.

The **owner or operator** of the construction site is responsible for complying with the requirements of the permit. Responsibilities include developing a Plan, obtaining permit coverage, implementing BMPs, and stabilizing the site at the end of the construction activity.

Construction sites that discharge unpermitted stormwater are in violation of the Clean Water Act and may be subject to fines of up to $27,500 a day per violation.

Determine your eligibility

All construction activity that disturbs 1 or more acres of land, as well as activity that disturbs less than 1 acre but is part of a larger common plan of development, must obtain permit coverage.

Read and understand your stormwater permit requirements

Get a copy of the permit for construction activities and a permit application (or notice of intent form) from your state or EPA permitting authority.

Develop a Plan

Most states do not require you to submit your Plan. However, you do need to keep the Plan on site. If that's impractical, you may post a notice that tells where the Plan is kept so it can be accessed by the permitting authority and other interested parties.

You'll need to post a copy of your completed application on site. Put it in a place where the public can see it so they'll know your site is covered by an NPDES permit!

Apply for permit coverage

Once you understand your permit requirements and have developed a Plan, you can submit a stormwater permit application (or notice of intent) to your permitting authority. This must be done before beginning any land disturbance on the site. Some states require a few days of lead time, so check with your permitting authority. Once you've submitted the application, you must satisfy the conditions of the permit.

Implement the Plan

Be prepared to implement the BMPs in your Plan before construction begins. Ensure that BMPs are properly maintained, and upgrade and repair them as necessary.

Developing and Implementing a Plan

You must have a Plan that includes erosion and sediment control and pollution prevention BMPs. These Plans require

- Advance planning and training to ensure proper implementation of the BMPs
- Erosion and sediment control BMPs in place until the area is permanently stabilized
- Pollution prevention BMPs to keep the construction site "clean"
- Regular inspection of the construction site to ensure proper installation and maintenance of BMPs

Fortunately, the practices and measures that must be included in your Plan are already part of the standard operating procedures at many construction sites.

Six steps are associated with developing and implementing a stormwater Plan. There's a wealth of information available on developing pollution prevention plans. Please contact your permitting authority for help in finding additional guidance materials, or visit www.epa.gov/npdes/stormwater. A sample construction plan is available at www.epa.gov/npdes/pubs/sample_swppp.pdf.

1. *Site Evaluation and Design Development*

- **Collect site information**
- **Develop site plan design**
- **Prepare pollution prevention site map**

The first step in preparing a Plan is to define the characteristics of the site and the type of construction that will occur. This involves collecting site information, identifying natural features that should be protected, developing a site plan design, describing the nature of the construction activity, and preparing a pollution prevention site map.

2. *Assessment*

- **Measure the site area**
- **Determine the drainage areas**
- **Calculate the runoff coefficient**

The next step is assessing the impact the project will have on stormwater runoff. Determine the drainage areas and estimate the runoff amounts and velocities. For more information on calculatng the runoff coefficient, go to www.epa.gov/npdes/pubs/chap02_conguide.pdf, page 11.

3. *Control Selection and Plan Design*

- **Review and incorporate state or local requirements**
- **Select erosion and sediment controls**
- **Select other controls**
- **Select stormwater management controls**
- **Indicate the location of controls on the site map**
- **Prepare an inspection and maintenance plan**
- **Coordinate controls with construction activity**
- **Prepare sequence of major activities**

In the third step you'll actually document your procedures to prevent and control polluted stormwater runoff. You must delineate areas that will not be disturbed, including critical natural areas like streamside areas, floodplains, and trees. You must also identify the measures (or BMPs) you'll use to protect these areas.

Phasing your project to minimize the amount of exposed soil at any given time is a highly effective way to prevent erosion. Erosion control measures designed to prevent soil from being mobilized include diversions to route stormwater away from exposed soils and stabilization with vegetation, mulch, and geotextiles. Sedimentation control measures designed to remove sediment from stormwater or prevent it from leaving the site include silt fences, sediment traps, and diversions.

You'll need to select erosion and sediment controls—including stabilization measures for protecting disturbed areas and structural controls for diverting runoff and removing sediment—that are appropriate for your particular site. The appropriateness of the control measures will depend on several factors, but will be influenced most directly by the site characteristics. Some stabilization measures you might consider are temporary seeding, permanent seeding, and mulching. Structural control measures include earth dikes, silt fences, and sediment traps. No single BMP will meet all of the erosion and sedimentation control needs of a construction site. A combination of BMPs is necessary. For more information on the types of BMPs appropriate for your construction site, see the BMP fact sheet series available at www.epa.gov/npdes/menuofbmps.

Soil erosion control tips...

- Design the site to infiltrate stormwater into the ground and to keep it out of storm drains. Eliminate or minimize the use of stormwater collection and conveyance systems while maximizing the use of stormwater infiltration and bioretention techniques.
- Minimize the amount of exposed soil on site.
  - To the extent possible, plan the project in stages to minimize the amount of area that is bare and subject to erosion. The less soil exposed, the easier and cheaper it will be to control erosion.
  - Vegetate disturbed areas with permanent or temporary seeding immediately upon reaching final grade.
  - Vegetate or cover stockpiles that will not be used immediately.
- Reduce the velocity of stormwater both onto and away from the project area.
  - Interceptors, diversions, vegetated buffers, and check dams are a few of the BMPs that can be used to slow down stormwater as it travels across and away from the project site.
  - Diversion measures can also be used to direct flow away from exposed areas toward stable portions of the site.
  - Silt fences and other types of perimeter filters should never be used to reduce the velocity of runoff.
- Protect defined channels immediately with measures adequate to handle the storm flows expected.
  - Sod, geotextile, natural fiber, riprap, or other stabilization measures should be used to allow the channels to carry water without causing erosion. Use softer measures like geotextile or vegetation where possible to prevent downstream impacts.
- Keep sediment on site.
  - Place aggregate or stone at construction site vehicle exits to accommodate at least two tire revolutions of large construction vehicles. Much of the dirt on the tires will fall off before the vehicle gets to the street.
  - Regular street sweeping at the construction entrance will prevent dirt from entering storm drains. Do not hose paved areas.
  - Sediment traps and basins are temporary structures and should be used in conjunction with other measures to reduce the amount of erosion.
- Maintaining all BMPs is critical to ensure their effectiveness during the life of the project.
  - Regularly remove collected sediment from silt fences, berms, traps, and other BMPs.
  - Ensure that geotextiles and mulch remain in place until vegetation is well established.
  - Maintain fences that protect sensitive areas, silt fences, diversion structures, and other BMPs.

Other BMPs and Activities to Control Polluted Runoff

You'll need to select other controls to address potential pollutant sources on your site. Construction materials, debris, trash, fuel, paint, and stockpiles become pollution sources when it rains. Basic pollution prevention practices can significantly reduce the amount of pollution leaving construction sites. The following are some simple practices that should be included in the Plan and implemented on site:

- Keep potential sources of pollution out of the rain as practicable (e.g., inside a building, covered with plastic or tarps, or sealed tightly in a leak-proof container).
- Clearly identify a protected, lined area for concrete truck washouts. This area should be located away from streams, storm drain inlets, or ditches and should be cleaned out periodically.
- Park, refuel, and maintain vehicles and equipment in one area of the site to minimize the area exposed to possible spills and fuel storage. This area should be well away from streams, storm drain inlets, or ditches. Keep spill kits close by and clean up any spills or leaks immediately, including spills on pavement or earthen surfaces.
- Practice good housekeeping. Keep the construction site free of litter, construction debris, and leaking containers. Keep all waste in one area to minimize cleaning.
- Never hose down paved surfaces to clean dust, debris, or trash. This water could wash directly into storm drains or streams. Sweep up materials and dispose of them in the trash. Never bury trash or debris!
- Dispose of hazardous materials properly.

4. *Certification and Notification*

- **Certify the Plan**
- **Submit permit application or notice of intent**

Once the Plan has been developed, an authorized representative must sign it. Now is the time to submit the permit application or notice of intent. Your permit might require that the Plan be kept on site, so be sure to keep it available for the staff implementing the Plan.

Erosion and sedimentation control practices are only as good as their installation and maintenance.

5. *Implementing and Maintaining a Plan*

- **Implement controls**
- **Inspect and maintain controls**
- **Update/change the Plan**
- **Report releases of hazardous materials**

A Plan describes the practices and activities you'll use to prevent stormwater contamination and meet the NPDES permit requirements. Make sure that the Plan is implemented and that the Plan is updated as necessary to reflect changes on the site.

Erosion and sedimentation control practices are only as good as their installation and maintenance. Train the contractors that will install the BMPs and inspect immediately to ensure that the BMPs have been installed correctly.

Regularly inspect the BMPs (especially before and after rain events) and perform any necessary repairs or maintenance immediately. Many BMPs are designed to handle a limited amount of sediment. If not maintained, they'll become ineffective and a source of sediment pollution.

It's also important to keep records of BMP installation, implementation, and maintenance. Keep track of major grading activities that occur on the site, when construction activities cease (temporarily or permanently), and when a site is temporarily or permanently stabilized.

If construction plans change at any time, or if more appropriate BMPs are chosen for the site, update the Plan accordingly.

6. *Completing the Project: Final Stabilization and Termination of the Permit*

- **Final stabilization**
- **Notice of Termination**
- **Record retention**

Many states and EPA require a Notice of Termination (NOT) or other notification signifying that the construction activity is completed. An NOT is required when

- Final stabilization has been achieved on all portions of the site for which the permittee is responsible.
- Another operator has assumed control over all areas of the site that have not been finally stabilized. That operator would need to submit a new permit application to the permitting authority.
- For residential construction only, temporary stabilization of a lot has been completed prior to transference of ownership to the homeowner, with the homeowner being made aware of the need to perform final stabilization.

Permittees must keep a copy of their permit application and their Plan for at least 3 years following final stabilization. This period may be longer depending on state and local requirements.

Preconstruction Checklist

- A site description, including
  - Nature of the activity
  - Intended sequence of major construction activities
  - Total area of the site
  - Existing soil type and rainfall runoff data
  - A site map with:
    - Drainage patterns
    - Approximate slopes after major grading
    - Area of soil disturbance
    - Outline of areas which will not be disturbed
    - Location of major structural and nonstructural soil erosion controls
    - Areas where stabilization practices are expected to occur
    - Surface waters
    - Stormwater discharge locations
  - Name of the receiving water(s)
- A description of controls:
  - Erosion and sediment controls, including
    - Stabilization practices for all areas disturbed by construction
    - Structural practices for all drainage/discharge locations
  - Stormwater management controls, including
    - Measures used to control pollutants occurring in stormwater discharges after construction activities are complete
    - Velocity dissipation devices to provide nonerosive flow conditions from the discharge point along the length of any outfall channel
  - Other controls, including
    - Waste disposal practices that prevent discharge of solid materials
    - Measures to minimize offset tracking of sediments by construction vehicles
    - Measures to ensure compliance with state or local waste disposal, sanitary sewer, or septic system regulations
  - Description of the timing during the construction when measures will be implemented
- State or local requirements incorporated into the Plan
- Inspection and maintenance procedures for control measures identified in the Plan
- Contractor certification and Plan certification

Implementation Checklist

- Maintain records of construction activities, including
  - Dates when major grading activities occur
  - Dates when construction activities temporarily cease on the site or a portion of the site
  - Dates when construction activities permanently cease on the site or a portion of the site
  - Dates when stabilization measures are completed on the site
- Prepare inspection reports summarizing
  - Name of person conducting BMP inspections
  - Qualifications of person conducting BMP inspections
  - BMPs/areas inspected
  - Observed conditions
  - Necessary changes to the Plan
- Report releases of reportable quantities of oil or hazardous materials
  - Notify the National Response Center at 800-424-8802 immediately
  - Report releases to your permitting authority immediately, or as specified in your permit. You must also provide a written report within 14 days.
  - Modify the Plan to include
    - The date of release
    - Circumstances leading to the release
    - Steps taken to prevent reoccurrence of the release
- Modify Plan as necessary
  - Incorporate requests of the permitting authority to bring the Plan into compliance
  - Address changes in design, construction operation, or maintenance that affect the potential for discharge of pollutants

An ounce of prevention is worth a pound of cure! It's far more efficient and cost-effective to prevent pollution than it is to try to correct problems later. Installing and maintaining simple BMPs and pollution prevention techniques on site can greatly reduce the potential for stormwater pollution and can also save you money!

Visit www.epa.gov/npdes/stormwater for more information.

StormWater CleanWater PROTECTION PROGRAM

RIVERSIDE COUNTY
ANIMAL SERVICES LOCATIONS:

www.rcdas.org

BLYTHE
16450 West Hobson Way
Blythe, CA 92225
760-921-7857

COACHELLA VALLEY ANIMAL CAMPUS
72-050 Petland Place
Thousand Palms, CA 92276
760-343-3644

RIVERSIDE COUNTY ANIMAL SERVICES
6851 Van Buren Blvd.
Riverside, CA 92509
951-688-4340

OTHER ANIMAL SHELTERS:

ANIMAL CARE CENTER OF INDIO
45-355 Van Buren
Indio, CA 92201
760-391-4138

ANIMAL FRIENDS OF THE VALLEYS
29001 Bastron Avenue
Lake Elsinore, CA 92530
951-674-0618
(Serving incorporated Temecula, Wildomar, Lake Elsinore, Murrieta and Canyon Lake)

MARY S. ROBERTS PET ADOPTION CENTER
6185 Industrial Avenue
Riverside, CA 92504
951-688-4340

RAMONA HUMANE SOCIETY
690 Humane Way
San Jacinto 92586
951-654-8002
(Serving Sun City, Menifee, Romoland and Homeland)

Looking to adopt a pet?
This website is linked to many animal shelters.
www.petfinder.com

To report illegal storm drain disposal, call
1-800-506-2555

Or visit our website at www.rcflood.org

E-mail fcnpdes@rcflood.org

What's the Scoop?

Tips for a Healthy Pet and a Healthier Environment

CREATE A HEALTHY ENVIRONMENT in and around your home by following these simple pet practices. Your pet, family and neighbors will appreciate their clean comfortable surroundings.

HOUSEHOLD PETS

We all love our pets, but pet waste is a subject everyone likes to avoid. Pet waste left on trails, sidewalks, streets and grassy areas can be washed into the nearest waterway when it rains. Even if you can't see streams or lakes near you, rainfall (stormwater) or sprinkler runoff can wash pet waste into the storm drains that carry runoff to the nearest streams or lakes untreated. The risk of stormwater contamination increases if pet waste is allowed to accumulate in outdoor animal pen areas or left on sidewalks, streets or driveways.

Pet waste contains nutrients and bacteria. Nutrients can promote the growth of algae in streams and lakes. Algae can cause fish kills and other environmental damage if it is fed too many nutrients. Pet Waste also contains e. Coli and fecal bacteria, which can cause disease in other animals and humans that come in contact with it when swimming or splashing in streams and lakes. Dogs also carry salmonella and giardia, which can make people sick.

Pet waste that is not picked up and properly disposed can also increase vector problems. Flies and other insects are not only attracted to and feed on pet waste, but can also be infected with diseases and spread those diseases to humans and other animals.

WHAT CAN YOU DO?

- SCOOP up pet waste and flush it down the toilet or place in trash can.
- NEVER DUMP pet waste into a storm drain or catch basin.
- USE the complimentary bags or mutt mitts offered in dispensers at local parks.
- CARRY EXTRA BAGS when walking your dog and make them available to other pet owners who are without.
- TEACH CHILDREN how to properly clean up after a pet.
- TELL FRIENDS AND NEIGHBORS about the ill effects of animal waste on the environment. Encourage them to clean up after pets.

Call 1-800-506-2555 TOLL FREE to report illegal dumping to the storm drain, find the dates and times of local Household Hazardous Waste Collection Events, obtain additional information on stormwater problems and solutions, request presentations about stormwater pollution in your child's classroom, or learn about free grasscycling and composting workshops.

SCOOP THE POOP

Many communities have "Scoop the Poop" laws that govern pet waste cleanup. Some of these laws specifically require anyone who walks an animal off their property to carry a bag, shovel, or scooper. Any waste left by the animal must be cleaned up immediately. CALL YOUR LOCAL CODE ENFORCEMENT OFFICE to find out more about pet waste regulations.

OTHER WAYS TO PROTECT YOUR PETS AND THE ENVIRONMENT

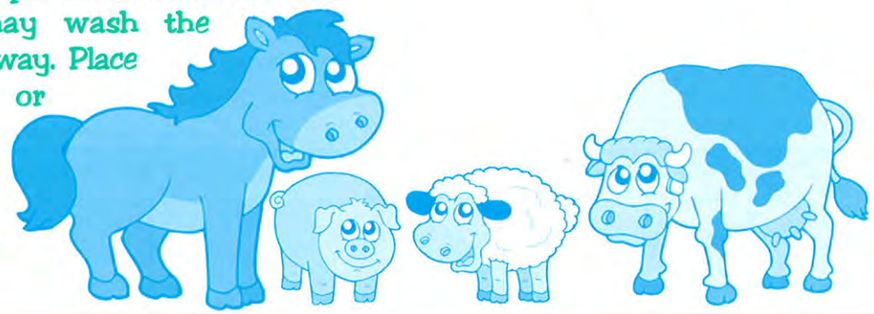
Pets are only one of many sources that contribute to water pollution. However, these other sources of water pollution cannot only harm the environment but also harm your pet. Improperly used or stored lawn fertilizers, pesticides, soaps, grease and vehicle fluids cannot only be washed into local streams and lakes, these chemicals can also harm your pet if they ingest or touch these chemicals. Call 1-800-506-2555 for information regarding how to properly dispose of household hazardous wastes such as these. You can also keep your pets and our environment healthy by properly maintaining your vehicles, and limiting use of pesticides and fertilizers to only the amount that is absolutely needed.

Make sure to not only protect your pets, but to also protect your neighbors pets. NEVER HOSE VEHICLE FLUIDS into the street or gutter. USE ABSORBENT MATERIALS such as cat litter to clean-up spills. SWEEP UP used absorbent materials and place it in the trash.

HORSES AND LIVESTOCK

Fortunate enough to own a horse or livestock? You, too, can play a part in protecting and cleaning up our water resources. The following are a few simple Best Management Practices (BMPs) specifically designed for horses and livestock.

- STORE your manure properly. Do not store unprotected piles of manure in places where stormwater runoff may wash the manure away. Place a cover or tarp over the pile to keep rainwater out.



- BUILD a manure storage facility to protect your pets, property and the environment. These structures usually consist of a concrete pad to protect groundwater and a short wall on one or two sides to make manure handling easier.

- READ the Only Rain Down the Storm Drain brochure titled "Tips for Horse Care" for additional guidance and recommendations. This brochure should be available from your local city office or for download at www.rcflood.org/stormwater.

- KEEP animals out of streams - Horses and livestock can deficate in streams causing stormwater pollution. Livestock and horses in streams can also disturb sensitive habitat and vegetation, causing additional environmental damage. Keep livestock and horses away from streams and use designated stream crossings whenever possible.

- MATERIAL STORAGE SAFETY TIPS Many of the chemicals found in barns require careful handling and proper disposal. When using these chemicals, be certain to follow these common sense guidelines:
  - Buy only what you need.
  - Treat spills of hoof oils like a fuel spill. Use kitty litter to soak up the oil and dispose of it in a tightly sealed plastic bag.
  - Store pesticides in a locked, dry, well-ventilated area.
  - Protect stored fertilizer and pesticides from rain and surface water.

RESOURCE CONSERVATION DISTRICTS CAN HELP

Call 1-800-506-2555 for assistance with locating a local conservation district that can help you properly manage your manure, re-establish healthy pastures, control weeds, or identify appropriate grasses for your soils.

Thank you for doing your part to protect your watershed, the environment, your pets and your community!

For Information:

For information on “closed-loop” suppliers and recycling/disposal vendors, contact:
County of Riverside
Health Services Agency
Department of Environmental Health
at (909) 358-5055.

SPILL RESPONSE AGENCY:
HAZ-MAT: (909) 358-5055
AFTER 5:00 P.M.: (909) 358-5245 OR 911

HAZARDOUS WASTE DISPOSAL: (909) 358-5055

RECYCLING INFORMATION: 1-800-366-SAVE

TO REPORT ILLEGAL DUMPING OR A CLOGGED STORM DRAIN: 1-800-506-2555

To order additional brochures or to obtain information on other pollution prevention activities, call: (909) 955-1111.

The Cities and County of Riverside
StormWater/CleanWater Protection Program
1-800-506-2555

StormWater
CleanWater
PROTECTION PROGRAM

Riverside County gratefully acknowledges the Santa Clara Valley Nonpoint Source Pollution Control Program, Alameda Countywide Clean Water Program and the San Bernardino County Stormwater Program for information provided in this brochure.

StormWater Pollution

What you should know for...

THE FOOD SERVICE INDUSTRY

Best Management Practices (BMPS) for:

- Restaurants
- Grocery Stores
- Delicatessens
- Bakeries

StormWater Pollution . . . What You Should Know

Riverside County has two drainage systems - sanitary sewers and storm drains. The storm drain system is designed to help prevent flooding by carrying excess rainwater away from streets. Since the storm drain system does not provide for water treatment, it also serves the *unintended* function of transporting pollutants directly to our waterways.

Unlike sanitary sewers, storm drains are not connected to a treatment plant - they flow directly to our local streams, rivers and lakes.

Waste or washwater generated by the food service industry often contains materials such as food wastes, oil, grease, detergents, and degreasers. These materials can degrade local waters when allowed to flow into a storm drain system.

Stormwater pollution causes as much as 60% of our water pollution problem. It jeopardizes the quality of our waterways and poses a threat to groundwater resources if pollutants percolate through soil.

The Cities and County of Riverside StormWater/CleanWater Protection Program

Since preventing pollution is much easier, and less costly, than cleaning up “after the fact,” the Cities and County of Riverside StormWater/CleanWater Protection Program informs residents and businesses on pollution prevention activities such as the Best Management Practices (BMPs) described in this pamphlet.

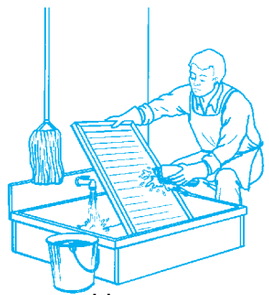
The Cities and County of Riverside have adopted ordinances for stormwater management and discharge control. In accordance with state and federal law, these local stormwater ordinances **prohibit** the discharge of wastes into the storm drain system or local surface waters. This includes discharges from the food service industry containing food wastes, oil, grease, detergents, and degreasers.

PLEASE NOTE: A common stormwater pollution problem associated with the food service industry is the discharge of washwater into alleys and gutters, and the hosing down of outdoor areas. Often, these activities flush pollutants into the storm drain system. The discharges of pollutants is ***strictly prohibited*** by local ordinances and state and federal regulations.

A Menu of Activities . . . to Keep Our Water Clean

Cleanin' It Right . . .

Pour mop and wash water into the mop sink or down floor drains . . . not into gutters, alleys, parking lots or a storm drain. Wash greasy equipment only in designated wash areas which are properly connected to the sewer system with an appropriate oil/water separator. Also, avoid washing kitchen mats, garbage containers, and other items in areas where wastewater is likely to flow into a storm drain.



Watch Out For Spills . . .

Use dry methods for spill cleanup. Don't hose down outside spills. Use rags or absorbents such as cat litter and then dispose of in the garbage, or handle as hazardous waste as appropriate. If necessary, mop the area with a minimum amount of water.

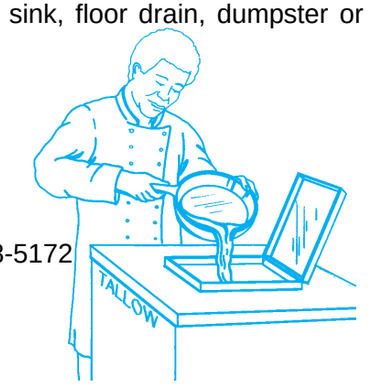
Proper Storage and Disposal . . .

General cleaners, floor cleaners, solvents, and detergents often contain toxic substances. Read labels carefully and store and dispose of these products properly.

REMEMBER: Don't throw toxic waste into the trash or into a storm drain. To report toxic spill call 911. For information on hazardous waste pick-up call (909) 358-5055.

Grease and Oil . . .

Handle and dispose of grease properly. Save used cooking grease and oil for recycling in tallow bins or sealed containers. Never pour grease into a sink, floor drain, dumpster or storm drain. Watch out for, and report to management, overflowing grease interceptors. Call (909) 358-5172 for disposal information.

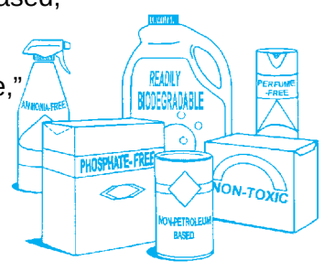


How 'Bout That Dumpster . . .

Keep dumpster and loading dock areas clean. Control litter by sweeping - don't hose down the area. Replace leaky dumpsters and keep lids closed to keep out rainwater.

Use Water-Friendly Products . . .

Whenever possible, purchase water-based cleaning products. Look for products labeled "non-toxic," "non-petroleum based," "ammonia-free," "phosphate-free," and "perfume-free," or "readily biodegradable."



Outdoor/Sidewalk Areas . . .

Sweep up food particles, cigarette butts, and trash from outdoor dining areas before rinsing or steam cleaning. Don't use toxic bleaches or detergents when you pressure wash outdoor dining areas, entrances or surrounding sidewalk areas.

***You may be** already implementing many of the BMPs prescribed in this brochure. However, if you discover any potential problem areas, please consider using one or more of the recommended BMPS.*

***Also,** please note that the Riverside County Environmental Health Department will monitor potential sources of stormwater pollution activities during regularly scheduled inspections of food service facilities. If Health Department staff observe activities which may be contributing to stormwater pollution, suggestions will be provided and/or use of prescribed BMPS listed in this brochure will be offered.*

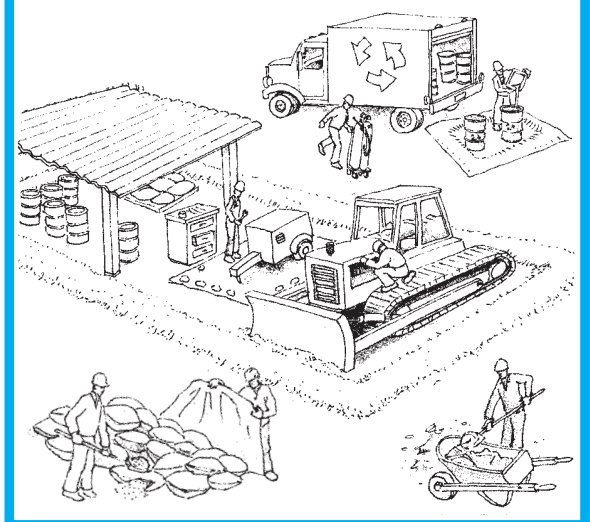
Please remember:

Everyone contributes a little to the problem of stormwater pollution. Now it's time for all of us to become part of the solution!

StormWater Pollution

What you should know for...

GENERAL CONSTRUCTION & SITE SUPERVISION



Best Management Practices (BMPs) for:

- Developers
- General Contractors
- Home Builders
- Construction Inspectors
- Anyone in the construction business

To report a hazardous materials spill, call:

Riverside County Hazardous Materials
Emergency Response Team
(909) 358-5055 8:00 a.m. – 5:00 p.m.
(909) 358-5245 after 5:00 p.m.

In an emergency call: **911**

For recycling and hazardous waste disposal, call:

(909) 358-5055

To report an illegal dumping or a clogged storm drain, call:

1-800-506-2555

To order additional brochures or to obtain information on other pollution prevention activities, please call (909) 955-1200 or visit the StormWater/CleanWater Protection Program website at:
www.co.riverside.ca.us/depts/flood/waterquality npdes.asp

StormWater CleanWater
PROTECTION PROGRAM

The StormWater/CleanWater Protection Program gratefully acknowledges the Santa Clara Valley Nonpoint Pollution Control Program, Alameda Countywide CleanWater Program and the City of Los Angeles Stormwater Management Division for information provided in this brochure.

Resources

State Water Resources Control Board
Division of Water Quality
1001 I Street
Sacramento CA 95814
(916) 341-5455
www.swrcb.ca.gov/stormwtr/

Colorado River Basin Regional Water
Quality Control Board - Region 7
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260
(760) 346-7491
www.swrcb.ca.gov/~rwqcb7/

Santa Ana Regional Water
Quality Control Board - Region 8
3737 Main Street, Suite 500
Riverside, CA 92501-3348
(909) 782-4130
www.swrcb.ca.gov/~rwqcb8/

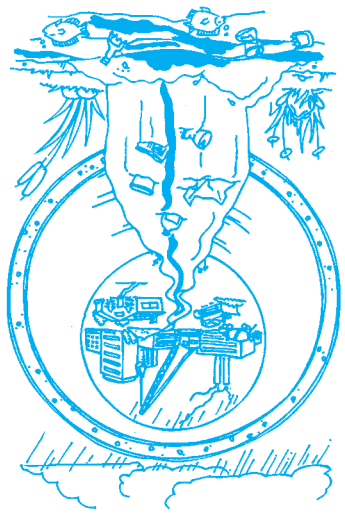
San Diego Regional Water
Quality Control Board - Region 9
9771 Clairemont Mesa Blvd., Suite A
San Diego, CA 92124
(858) 467-2952
www.swrcb.ca.gov/~rwqcb9/

StormWater Pollution . . . What You Should Know

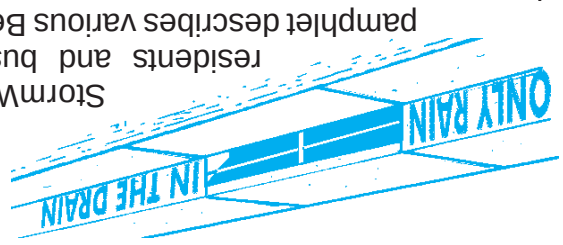
Riverside County has two drainage systems - sewers and storm drains. The storm drain system was designed to reduce flooding by carrying excess rainwater away from streets and developed areas. Since the storm drain system does not provide for water treatment, it also serves the *unintended* function of transporting pollutants directly to our local waterways.

Unlike sanitary sewers, storm drains are not connected to a wastewater treatment plant – they flow directly to our local streams, rivers and lakes.

Stormwater runoff is a part of the natural hydrologic process. However, land development and construction activities can significantly alter natural drainage processes and introduce pollutants into stormwater runoff. Polluted stormwater runoff from construction sites has been identified as a major source of water pollution in California. It jeopardizes the quality of our local waterways and can pose a serious threat to the health of our aquatic ecosystems.



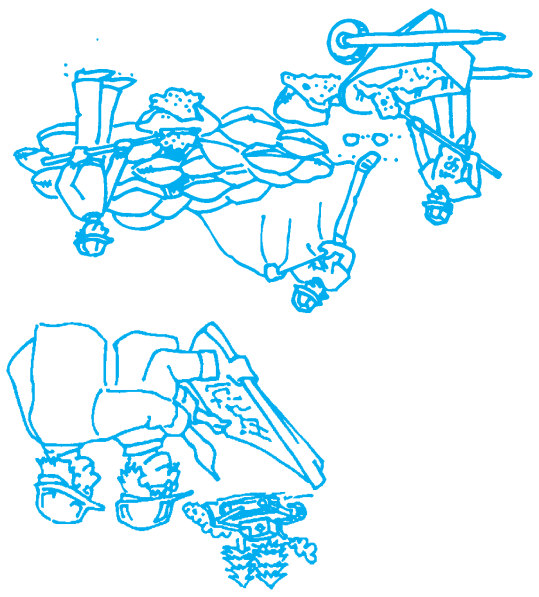
The Cities and County of Riverside StormWater/CleanWater Protection Program



Because preventing pollution is much easier and less costly than cleaning up "after the fact," the Cities and County of Riverside StormWater/CleanWater Protection Program informs residents and businesses on pollution prevention activities. This pamphlet describes various Best Management Practices (BMPs) that construction site operators can use to prevent stormwater pollution.

In accordance with applicable federal and state law, the Cities and County of Riverside have adopted ordinances for stormwater management and discharge control that **prohibit** the discharge of pollutants into the storm drain system or local surface water. This includes discharges from construction sites containing sediment, concrete, mortar, paint, solvents, lubricants, vehicle fluids, fuel, pesticides, and construction debris.

PLEASE NOTE: The Federal, State and local regulations strictly prohibit the discharge of sediment and pollutants into the streets, the storm drain system or waterways. As an owner, operator or supervisor of a construction site, you may be held financially responsible for any environmental damage caused by your subcontractors or employees.



STORMWATER POLLUTION FROM CONSTRUCTION ACTIVITIES

The two most common sources of stormwater pollution problems associated with construction activities are ***erosion*** and ***sedimentation***. Failure to maintain adequate erosion and sediment controls at construction sites often results in sediment discharges into the storm drain system, creating multiple problems once it enters local waterways.

Construction vehicles and heavy equipment can also track significant amounts of mud and sediment onto adjacent streets. Additionally, wind may transport construction materials and wastes into streets storm drains, or directly into our local waterways.

What Should You Do?

Advance Planning to Prevent Pollution

- ❑ Remove existing vegetation only as needed.
- ❑ Schedule excavation, grading, and paving operations for dry weather periods, if possible.
- ❑ Designate a specific area of the construction site, well away from storm drain inlets or watercourses, for material storage and equipment maintenance.
- ❑ Develop and implement an effective combination of erosion and sediment controls for the construction site.
- ❑ Practice source reduction by ordering only the amount of materials that are needed to finish the project.
- ❑ Educate your employees and subcontractors about stormwater management requirements and their pollution prevention responsibilities.
- ❑ Control the amount of surface runoff at the construction site by impeding internally generated flows and using berms or drainage ditches to direct incoming offsite flows to go around the site. ***Note:*** *Consult local drainage policies for more information.*

Best Management Practices

The following Best Management Practices (BMPs) can significantly reduce pollutant discharges from your construction site. Compliance with stormwater regulations can be as simple as minimizing stormwater contact with potential pollutants by providing covers and secondary containment for construction materials, designating areas away from storm drain systems for storing equipment and materials and implementing good housekeeping practices at the construction site.

- ❑ Protect all storm drain inlets and streams located near the construction site to prevent sediment-laden water from entering the storm drain system.
- ❑ Limit access to and from the site. Stabilize construction entrances/exits to minimize the track out of dirt and mud onto adjacent streets. Conduct frequent street sweeping.
- ❑ Protect stockpiles and construction materials from winds and rain by storing them under a roof, secured impermeable tarp or plastic sheeting.
- ❑ Avoid storing or stockpiling materials near storm drain inlets, gullies or streams.
- ❑ Phase grading operations to limit disturbed areas and duration of exposure.
- ❑ Perform major maintenance and repairs of vehicles and equipment offsite.
- ❑ Wash out concrete mixers only in designated washout areas at the construction site.
- ❑ Set-up and operate small concrete mixers on tarps or heavy plastic drop cloths.
- ❑ Keep construction sites clean by removing trash, debris, wastes, etc. on a regular basis.
- ❑ Clean-up spills immediately using dry clean-up methods (e.g., absorbent materials such as cat litter, sand or rags for liquid spills; sweeping for dry spills such as cement, mortar or fertilizer) and by removing the contaminated soil from spills on dirt areas. .
- ❑ Prevent erosion by implementing any or a combination of soil stabilization practices such as mulching, surface roughening, permanent or temporary seeding.
- ❑ Maintain all vehicles and equipment in good working condition. Inspect frequently for leaks, and repair promptly.
- ❑ Practice proper waste disposal. Many construction materials and wastes, including solvents, water-based paint, vehicle fluids, broken asphalt and concrete, wood, and cleared vegetation can be recycled. Materials that cannot be recycled must be taken to an appropriate landfill or disposed of as hazardous waste.
- ❑ Cover open dumpsters with secured tarps or plastic sheeting. Never clean out a dumpster by washing it down on the construction site.
- ❑ Arrange for an adequate debris disposal schedule to insure that dumpsters do not overflow.

General Construction Activities Stormwater Permit

(Construction Activities General Permit)

The State Water Resources Control Board (SWRCB) adopted a new Construction Activities General Permit (WQ Order No. 99-08DWQ) on August 19, 1999, superseding the now expired SWRCB statewide General Permit (WQ Order No. 92-08DWQ). This permit is administered and enforced by the SWRCB and the local Regional Water Quality Control Boards (RWQCB). The updated Construction Activities General Permit establishes a number of new stormwater management requirements for construction site operator.

NOTE: *Some construction activies stormwater permits are issued on a regional basis. Consult your local RWQCB to find out if your project requires coverage under any of these permits.*

Frequently Asked Questions:

Does my construction site require coverage under the Construction Activities General Permit?

Yes, if construction activity results in the disturbance of five or more acres of total land area or is part of a common plan of development that results in the disturbance of five or more acres.

How do I obtain coverage under the Construction Activities General Permit?

Obtain the permit package and submit the completed Notice of Intent (NOI) form to the SWRCB prior to grading or disturbing soil at the construction site. For ongoing construction activity involving a change of ownership, the new owner must submit a new NOI within 30 days of the date of change of ownership. The completed NOI along with the required fee should be mailed to the SWRCB.

What must I do to comply with the requirements of the Construction Activities General Permit?

- ● Implement BMPs for non-stormwater discharges year-round.
- ● Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) prior to commencing construction activities.
- ● Keep a copy of the SWPPP at the construction site for the entire duration of the project.
- ● Calculate the anticipated stormwater run-off.
- ● Implement an effective combination of erosion and sediment control on all soil disturbed areas.
- ● Conduct site inspections prior to anticipated storm events, every 24-hours during extended storm events, and after actual storm event.
- ● Perform repair and maintenance of BMPs as soon as possible after storm events depending upon worker safety.
- ● Update the SWPPP as needed, to manage pollutants or reflect changes in site conditions.
- ● Include description of post construction BMPs at the construction site, including parties responsible for long-term maintenance.

NOTE: *Please refer to the Construction Activities General Permit for detailed information. You may contact the SWRCB, your local RWQCB, or visit the SWRCB website at www.swrcb.ca.gov/stormwtr/ to obtain a State Construction Activities Stormwater General Permit packet.*

How long is this Construction Activities General Permit in effect?

The Permit coverage stays in effect untilyou submit a Notice of Termination (NOT) to the SWRCB. For the purpose of submitting a NOT, all soil disturbing activities have to be completed and one of the three following criteria has to be met:

1. Change of ownership;
2. A uniform vegetative cover with 70 percent coverage has been established; or,
3. Equivalent stabilization measures such as the use of reinforced channel liners, soil cement, fiber matrices, geotextiles, etc., have been employed.

Landscaping and garden maintenance activities can be major contributors to water pollution. Soils, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!

In Riverside County, report illegal discharges into the storm drain, call
1-800-506-2555
"Only Rain Down the Storm Drain"

Important Links:

Riverside County Household Hazardous Waste Collection Information
1-800-304-2226 or www.rivcowm.org

Riverside County Backyard Composting Program
1-800-366-SAVE

Integrated Pest Management (IPM) Solutions
www.ipm.ucdavis.edu

California Master Gardener Programs
www.mastergardeners.org
www.camastergardeners.ucdavis.edu

California Native Plant Society
www.cnps.org

The Riverside County "Only Rain Down the Storm Drain" Pollution Prevention Program gratefully acknowledges Orange County's Storm Water Program for their contribution to this brochure.

...Only Rain Down ...the Storm Drain

What you should know for... Landscape and Gardening

Best Management tips for:

- Professionals
- Novices
- Landscapers
- Gardeners
- Cultivators

Tips for Landscape & Gardening

This brochure will help you to get the most of your lawn and gardening efforts and keep our waterways clean. Clean waterways provide recreation, establish thriving fish habitats, secure safe sanctuaries for wildlife, and add beauty to our communities. NEVER allow gardening products or waste water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.

- Plant native vegetation to reduce the amount of water, fertilizers and pesticides applied to the landscape.
- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.

Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro-spray systems. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.

- Consider recycling your green waste and adding "nature's own fertilizer" to your lawn or garden.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.
- Rinse empty pesticide containers and re-use rinse water as you would use the product. Do not dump rinse water down storm drains or sewers. Dispose of empty containers in the trash.
- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting.
- Try natural long-term common sense solutions first. Integrated Pest Management (IPM) can provide landscaping guidance and solutions, such as:
  - **Physical Controls** - Try hand picking, barriers, traps or caulking holes to control weeds and pests.
  - **Biological Controls** - Use predatory insects to control harmful pests.
  - **Chemical Controls** - Check out www.ipm.ucdavis.edu before using chemicals. Remember, all chemicals should be used cautiously and in moderation.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Waste Collection Center to be recycled.
- *Dumping toxics into the street, gutter or storm drain is illegal!*

www.bewaterwise.com Great water conservation tips and drought tolerant garden designs.

www.ourwaterourworld.com Learn how to safely manage home and garden pests.

Additional information can also be found on the back of this brochure.

Living on the Edge

Your community preserves habitat for important native plants and animals. By habitat, we mean homes; food, water, and places with space to live. The habitat is managed as part of a ***biological conservation easement*****,** a legal agreement that permanently limits its use.

Many conservation easements include a waterway or wetland because plants and animals need clean, fresh water, the most limited resource in our dry Southern California climate. A waterway (also called watercourse, arroyo, wash) conveys a flowing creek, stream, or river, which provides drinking water for local and migrating wildlife.

Not all of our waterways have visible flowing water year-round. Some creeks and streams continue to flow underground, while others flow for a short time after a storm (ephemeral). The small, and often dry washes are important to wildlife because they provide habitat and their periodic flows drain into larger waterways. It's essential that people do not degrade the quality of any water that reaches local waterways.

Water supports an abundance of vegetation and a variety of life, or *biodiversity.* Streamside vegetation, along dry or flowing waterways, is referred to as *riparian.* **Native** riparian plants provide **native** animals with suitable food, shelter, nesting sites and escape-cover from predators.

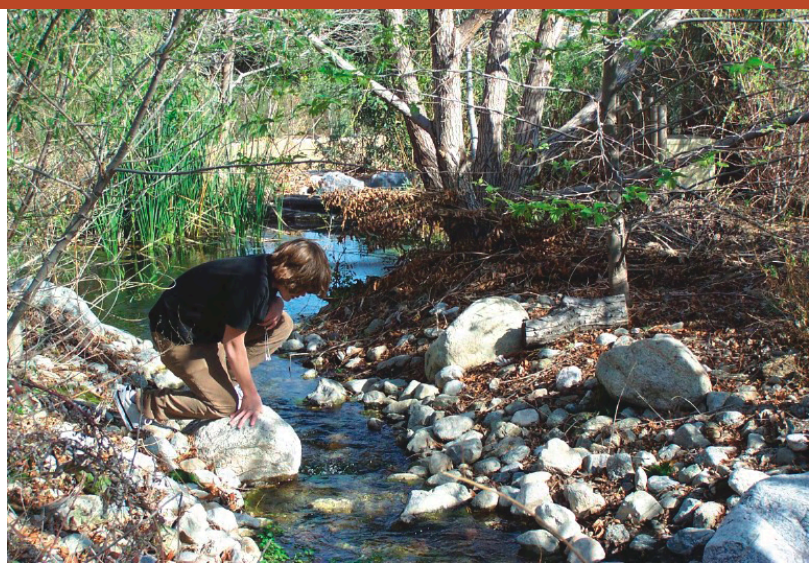
Help Your Wild Next-Door Neighbors

The purpose of this publication is to help homeowners become *habitat-friendly* neighbors for nearby habitat lands. The *Resources Directory*, inserted inside this booklet, provides helpful websites and contact information for agencies, organizations, gardens, and native plant nurseries.

Gerald & Buff Corsi, California Academy of Sciences

Unfortunately, our modern-day lifestyles have negative impacts on the environment around us. Human activity in, or near waterways can damage the capacity of the habitat to support some kinds of plant and animal life, especially species that do not adapt to urban/suburban conditions. Here are some ways to prevent and reduce negative impacts and help restore habitat to healthy conditions.

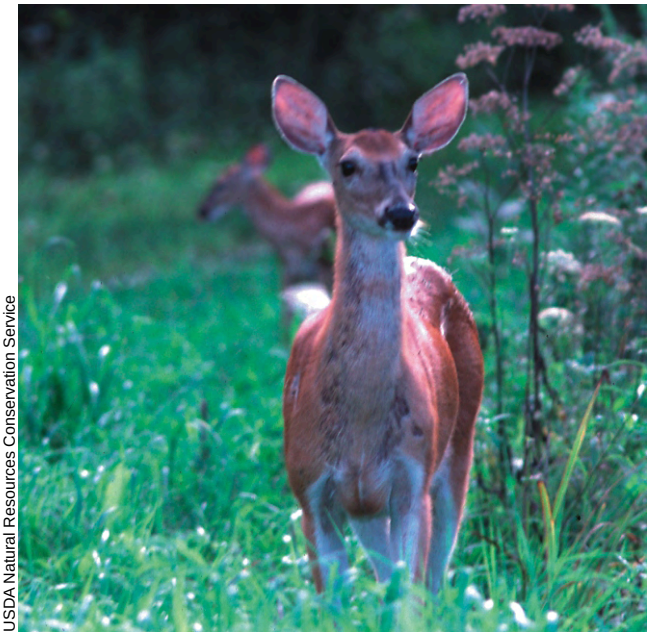
Reduce Impacts on Native Wildlife



Diana Ruiz

Prevent light, noise, and activity in, and adjacent to wetlands.

- If you wish to observe wildlife, please watch from afar, especially during the breeding and nesting season, from March to September. Most wild animals are naturally fearful of human contact. Human activity near a nest or den may frighten adult animals away from young and jeopardize their survival.
- When visiting natural areas, disturb as little as possible. Avoid walking or riding in a stream course or on channel banks. Heavy foot traffic, horses, and off-road vehicles may cause channel banks to collapse, accelerating erosion and increasing water-born sediment and turbidity.
- Help control entry into habitat areas. Close unessential roadways to prevent access for illegal dumping, trespass, and off-road vehicle use.
- Leave nothing behind.
- Focus necessary lighting downward and inward toward your home, yard, and buildings.
- To report poaching or polluting call CalTIP, Californians Turn In Poachers and Polluters, a confidential secret witness program. The toll free telephone number operates 24 hours a day, 7 days a week. (See the *Resources Directory* insert for contact information.)



USDA Natural Resources Conservation Service

Do not allow pets to roam in habitat land where they will disturb and hunt native wildlife. Keep pets on a leash and droppings out of waterways. Cats and dogs stress or kill wildlife and prevent natural ecosystems from supporting their own predators, such as hawks, coyotes, foxes, and bobcats. Conversely, domesticated animals face hazards in wild areas. Pets may be attacked by predators, such as coyotes and rattlesnakes, or may contract disease, fleas, and ticks.

Do not release unwanted animals into the wild. Abandoned cats, dogs, birds, reptiles and fish can have significant impacts on populations of native species, either through disease, predation or competition for food and space.

Lee Karney/ U.S. Fish and Wildlife Service

Brown-headed Cowbird

- Exotic invaders crowd out native species both on land and in water. Do not place fish, frogs, crayfish, turtles, or aquatic plants into creeks, streams or lakes. Some non-native species are not only able to survive, but also reproduce explosively due to a lack of natural predators. For example, the brown-headed cowbird is overwhelming riparian habitats. The cowbird lays its eggs in another bird's nest to the detriment of the host's young.

Mark A. Chappell

The endangered Least Bell's Vireo is threatened by the Brown-headed Cowbird.

- Pets are usually unable to survive in wildlands. They starve to death or are eaten. If you cannot find a home for a pet, contact animal control, your local animal shelter, or the Humane Society.

Respect and protect wild animals by keeping them wild. In some instances, being a good neighbor means protecting your living area by excluding certain kinds of wildlife, mainly mammals. The *human habitat* includes home sites, buildings, yards, gardens, and regularly used outdoor areas. Install fencing around the human habitat portion of your property and secure enclosures to protect children, pets, and farm animals.

- Do not take small animals, such as tortoises, tadpoles, frogs, snakes, birds, lizards or eggs from the wild. Never attempt to "adopt" or domesticate a wild animal.

- Discourage dangerous predators from penetrating human habitat areas. Install fencing that will exclude predators. Place sensors that trigger sprinklers and lights to deter predators and mammals from entering areas of human activity.

- Prevent mammals from living in and near your home by closing entries, filling holes, and removing brush, junk, and woodpiles near buildings.

- Don't feed human food to wildlife. Do not leave pet food outside. Prevent garbage from becoming a food source for wild mammals by sealing trash can lids. If you compost, use closed-containers or turn piles regularly. Compost plant material only; meat scraps should not be mixed in a compost pile.

R. H. Barrett/ U. S. Fish and Wildlife Service

For more information, contact the California Department of Fish and Game.
(See the *Resources Directory* insert for contact information.)

Reduce Impacts on Native Plants

Remove invasive, non-native plants from home landscaping and adjacent habitat lands, especially those that quickly spread through waterways, displacing important native species.

Diana Ruiz

Invasive Giant Reed (*Arrundo donax)* is being removed from Temescal Creek.

DO NOT PLANT

Giant reed	*Arundo donax*
Salt Cedar	*Tamarix chinensis*
Tree of Heaven	*Ailanthus altissima*
Red apple, heartleaf iceplant	*Aptenia cordifolia*
Fountain grass (yellow)	*Pennisetum setaceum*
Castor bean	*Ricinus communis*
Periwinkle	*Vinca major*
Peruvian (Calif.) pepper tree	*Schinus molle*
Brazilian pepper tree	*Schinus terebinthifolius*
Mexican fan palm	*Washingtonia robusta*
Sweet fennel	*Foeniculum vulgare*
Pampas grass/Jubata grass	*Cortaderia jubata/selloana*
Common iceplant	*Mesembryanthemum crystallinum*
Myoporum species	

Contact your local Resource Conservation District for help identifying invasive species and for removal of exotic weeds from waterways. Visit the California Invasive Plant Council web site for suggested plants to replace invasives. (See the *Resources Directory* insert for contact information.)

Protect Water Quality

Diana Ruiz

Make sure that the water that flows off your property is clean.

- Prevent trash, debris, and waste of any kind from washing off homesites and streets into gutters, storm drains, and dry washes. These drainage-ways empty into streams that flow to the Santa Ana River, and ultimately, the ocean.
- Evaluate the flow of runoff over your property. Place manure, barnyard bedding, and debris in areas where water does not pool or flow, or reuse the waste as fertilizer or mulch. Check with your local municipality for ordinances concerning the disposal of manure and bedding.
- Use care when applying fertilizers, pesticides, and herbicides on your property. Read labels “before you buy and before you apply” for directions, application rates, and disposal. Apply the correct amount at the proper time, for example, not during plant dormancy.

Praying mantis

Ladybird beetle

Lacewing

Photos by Greg Balmer

- Reduce or eliminate the use of pesticides by using “beneficial insects” (ladybugs, praying mantids, lacewings, etc.) If you must use a pesticide, use one with a *least-toxic* rating, such as insecticidal soaps, horticultural oils, pyrethrin-based insecticides, and insect growth regulators.
- Control erosion to prevent sediment from entering runoff.
- If you have a septic system, inspect and maintain it. Poorly placed and neglected septic systems contaminate groundwater and streams.

Pollutants that flow from residential and urban areas contaminate surface water and the water that percolates into underground water basins (aquifers). Much of our local water supply is pumped from underground aquifers, so keeping runoff clean is essential.

To report any non-emergency crime, such as dumping, please call your City Police or County Sheriff Departments. To report illegal grading or dumping in waterways, contact your City or County Code Enforcement Department. (See the *Resources Directory* insert for contact numbers.)

Dispose of waste in its proper place.

- Read product labels, and dispose of household hazardous wastes (oil based paints, pesticides, antifreeze, motor oil, batteries, flourescent bulbs, etc.) in prescribed ways and at designated disposal sites or community collection events, not on the ground or in a storm drain inlet. Whenever possible, reduce the use of hazardous materials in and around your home. Call the *Only Rain Down the Storm Drain* program for disposal dates and locations. (See the *Resources Directory* insert for contact numbers.) You can also recycle automotive fluids, tires, and batteries at car repair businesses.
- Dispose of trash at sanitary landfills.
- Compost yard and other organic wastes.

Diana Ruiz

Better yet:

Reduce,
Reuse,
Recycle.

Provide Space for Habitat, Fire, and Flood Protection

Robert Calvo

Siting Homes Near Waterways
If you are building next to a waterway, leave a buffer between the waterway and your *human habitat* area of graded pads, structures, and ornamental landscaping. *Wildlife habitat* land includes areas beyond buildings, yards, and defensible space (fire safety zones), generally to be left undisturbed for wildlife. A buffer between the human habitat and a waterway provides space for habitat, flood waters, and for wildlife escape during high water.

The buffer or "setback" distance will vary according to site conditions, however a minimum 100-foot setback from the **top edge** of a waterway, not from the water itself, is recommended. This allows space for creek/stream meander and high water flows. The banks of creeks and streams "meander", which means they are constantly "wandering" or relocating. Meander naturally occurs when flows cause erosion of channel banks and deposition of sediment.

As land is converted to urban uses, the volume of flow in waterways increases. Impervious surfaces from streets, roofs, and parking lots increase the amount of runoff, erosion and pollutants that degrade water quality.

Frank Heyming

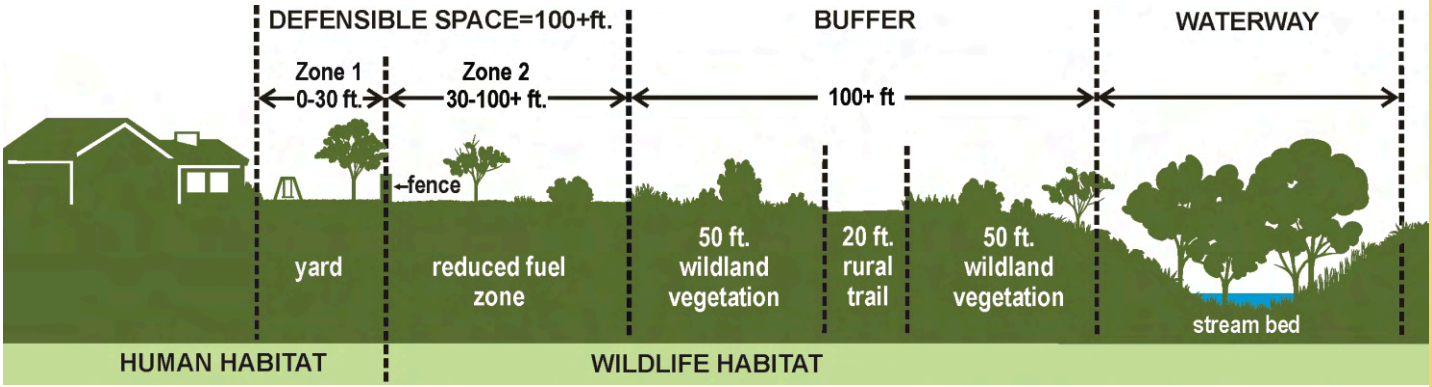
A house pad fills an important tributary to an waterway.

Many people are not aware of the vulnerability of natural ecosystems, nor are they aware that it is illegal to grade or alter a waterway without an assessment and permits from resource agencies and municipalities. If you propose an activity that will impact a stream, river, or lake, the California Department of Fish and Game (DFG) requires completion of a Streambed Alteration Agreement. Depending on the activity you are proposing, you may need to obtain a permit, agreement, or other authorization from one or more government agencies. Notify DFG, U.S. Army Corps of Engineers, and the Santa Ana Regional Water Quality Control Board during early planning, prior to beginning a project that will:

- use material from a streambed;
- divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake;
- result in the disposal or deposition of debris, waste, or other natural material where it can pass into any river, stream, or lake.

A Streambed Alteration Agreement is also required for streams that flow intermittently, such as dry washes and waterways with subsurface flow.

It is essential that landowners do not confine, or encroach on waterways. Keep buildings, septic systems, horses, livestock, fencing, agricultural and ornamental plantings out of waterways and away from channel banks.



When building homes In fire-prone areas, avoid ridge tops and canyons. Set buildings back from the edge of steep slopes. Create a minimum distance of 100-feet of *defensible space,* a managed area around a home, where the amount of fuel (dead plants, dry leaves, wood) has been reduced. Consult with your local fire department or the California Department of Forestry and Fire Protection for fire safety and weed abatement information.
(Please see *Resources Directory* insert).

Habitat-friendly Yards

Len Nunney

Landscape with Locals. Not just any California native plant is suitable for landscapes near habitat lands. Local native plants are the safest because they have unique characteristics that have helped them survive in their specific environments. Gardening with local flora helps maintain the *genetic integrity* of local plants and ecosystems. It helps maintain regional variation in vegetation and wildlife.

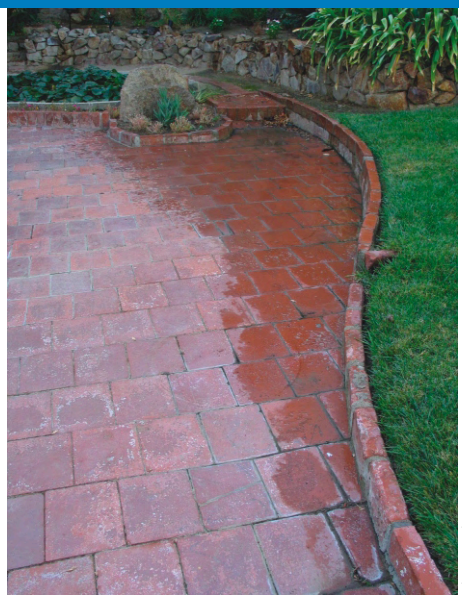
Why is regional variation important? If plants from other areas crossbreed with local natives, scientists fear that local populations would lose some of the unique characteristics that are important for success in this region. Their genetic material would no longer be unique and regionally identifiable. Plant interbreeding could reduce biological diversity, *biodiversity*, in the gene pool. There are important interactions between native plants, microorganisms, and the animals that use them, some of which are critical to the reproduction and survival of native plants and animals.

Create habitat in your yard for urban-adapted wildlife. Even if you live in the heart of a city, consider gardening for urban-adapted wildlife by providing a reliable water source and **local** native plants that provide food, shelter, and nesting sites. Each small patch of yard provides a stepping-stone of habitat from wildlands across the city. A patchwork of *habitat-yards* creates an urban ecosystem that more closely mimics our predevelopment, native landscape. When linked together, those patches cumulatively support biodiversity. To host a variety of native birds and butterflies in your yard, select plants that flower and fruit at different times of the year. Prune trees and shrubs in fall and early winter, rather than spring, to avoid destroying bird nests.

Benefits of landscaping with local native plants:

- **Most native plants are drought tolerant, so they require less water.**
- **Natives rarely require fertilizers.**
- **Patches of habitat support urban-adapted wildlife, such as birds, bats and insects that help pollinate plants.**
- **Natives rarely require pesticides. Native plants provide their own natural pest control by attracting beneficial insects that prey on troublesome bugs.**
- **Local natives help preserve *genetic diversity* and the integrity of local ecosystems.**

Water-wise Landscapes Conserve Water



Diana Ruiz

Reduce water-use by replacing unnecessary lawn areas with native or drought-tolerant plants and with hardscape (hard surfaces), such as walkways and patios of concrete, brick, stone, decomposed granite, and permeable paving. For places where you do need a lawn, such as play areas, plant a low water-use turf variety.

When selecting a plant, find out:

- Is it water-thirsty or drought-tolerant?
- When is its growing season; when will it need water?

Most* local native plants are dormant or slow-growing during the hot, dry summers; their growth occurs during our rainy season. Once established, many survive with rainfall alone. This is the opposite for non-native, ornamental landscapes that grow slowly, or not at all during winter, but require irrigation throughout the summer.

- Group plants with similar watering needs together, and install water-saving irrigation systems (drip, micro-sprayers) to apply the correct amount for each *hydro-zone* or plant grouping. Trees require deep irrigation and may need separate irrigation lines.
- Readjust your irrigation schedule for season and weather conditions. Turn off automatic systems when it's raining. Don't run sprinklers when the wind is blowing. Water deeply and only when needed. Water plants in the early morning or evening. Adjust irrigation systems to water soil, not concrete and pavement.
- Apply mulch (bark, compost, sawdust, gravel) to reduce evaporation from the soil surface and to control weeds.

For information about conserving water in landscapes and using native and drought tolerant plants, refer to plant databases, such as the one at bewaterwise.com. The website will also help you create a customized watering schedule for your yard. (See the *Resources Directory* insert for booklist and websites.)

*Not all native plants are dormant during summer: local riparian plants are the exception. They need water year round, as they are suited for waterways. Streamside vegetation, along dry or flowing waterways, is referred to as riparian.

Fire-wise Landscaping

Create a minimum distance of 100 ft. of *defensible space*, a landscape that deprives fire of fuel. Use fire-resistant plants and remove plants that are highly volatile.

Zone 1: Lean, Clean and Green

Zone 1 is from 0-30 ft. out from buildings. (See diagram on prior page.)
Grow plants that are small or succulent, such as irrigated lawns or ground covers and low growing, high-moisture shrubs. If you use native plants, use those that can be trimmed back during the dry season or that stay small with little trimming. Native plants that tolerate summer watering (see native plant lists) should be kept well hydrated.*

- Keep plants well hydrated to help them resist fire. Well-trimmed and watered plants are less likely to ignite than desiccated plants that have a buildup of dry stems and leaves.
- Fire needs fuel to burn, so remove any unnecessary plant materials. Prune dead wood and clean the landscape of dead plants, dry leaves, dry brush, firewood, and combustibles.
- Strategically place hard surfaces in your landscape, such as concrete, brick, or stone patios, driveways, pools, walls, and non-flammable decks, to interrupt the spread of fire to buildings.

Zone 2: Reduced Fuel

Create the reduced fuel zone beginning 30 ft. from buildings and extending 100 ft. or more, depending on steepness of slope and type/density of vegetation.

- Selectively remove large shrubby plants and dense groupings. Thin overcrowded plants. Mow grasses and weedy vegetation while they are green.
- Carefully remove excess plants without disturbing the soil; mow instead of disc, to prevent erosion and invasion of non-native plants.
- In chaparral plant communities, after thinning, reduce old, woody growth by cutting plants to their bases every few years, during the summer dormancy. Young plant tissues have higher moisture content and are less flammable. The heavy pruning eliminates mature, highly flammable vegetation but maintains root systems to protect the soil from erosion.
- Low branches and plants growing under trees create “ladders” for fire to climb. Eliminate ladder fuels, plants that serve as a link between grass and treetops. Prune the lower branches from the lower 1/3 of trees and shrubs. For trees or shrubs taller than 18 feet, prune the lower branches 6 feet above the ground. Remove dead leaves, twigs, and branches.
- In general, remove shrubs that are growing below trees, unless there is a space between the top of the shrub to the lowest branch of the tree that is three times the height of the shrub.

Remove plants that ignite easily and burn hot, such as those with volatile oils (sages) and those that accumulate fine woody branches or many small, dry leaves (chamise). In Zone 1, remove highly volatile plants (partial list below). In Zone 2, remove or widely space volatile plant types, including:

Chamise, *Adenostoma fasciculata*
Brittlebrush, *Encelia farinosa*
California buckwheat, *Eriogonum fasciculatum*
White sage, *Salvia apiana*
Some Eucalyptus and Acacia

Black sage, *Salvia mellifera*
Woolly blue curls, *Trichostema lanatum*
Mountain blue curls, *Trichostema parishii*
Red Shank, *Adenostoma sparsifolium*
All Pine, Cypress, Juniper, and Cedar species.

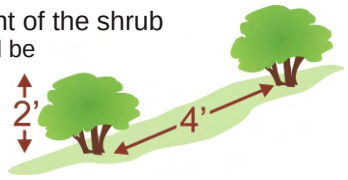
*For best results with native plants, water on overcast days during summer and fall.

Create Space Between Plants

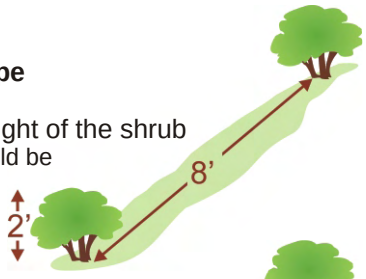
Shrubs

From edge of one shrub to the edge of the next.

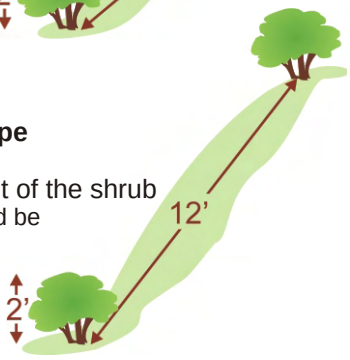
Flat to mild slope
(0% to 20% slope)
Two times (2x) the height of the shrub
(Two shrubs 2' high should be spaced 4' apart)



Mild to moderate slope
(20% to 40% slope)
Four times (4x) the height of the shrub
(Two shrubs 2' high should be spaced 8' apart)



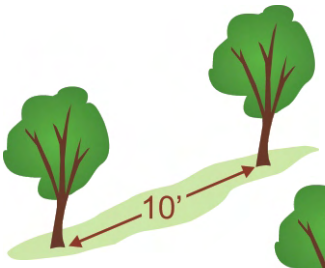
Moderate to steep slope
(greater than 40% slope)
Six times (6x) the height of the shrub
(Two shrubs 2' high should be spaced 12' apart)



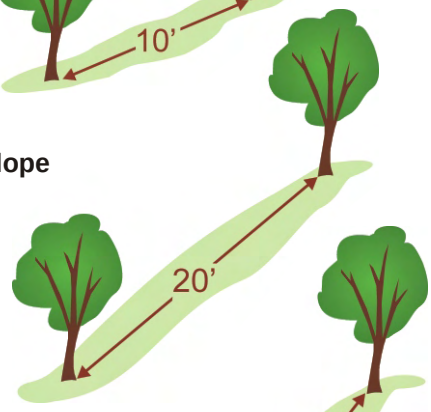
Trees

From edge of one tree canopy to the edge of the next.

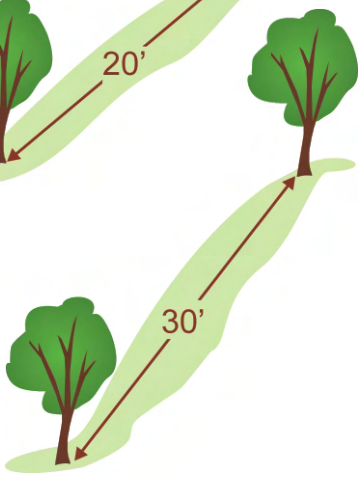
Flat to mild slope
(0% to 20% slope)



Mild to moderate slope
(20% to 40% slope)



Moderate to steep slope
(greater than 40% slope)



Horizontal clearance information from the California Department of Forestry and Fire Protection.

Prevent erosion and stabilize eroding areas. If you have exposed soil surfaces, cover with mulch, and landscape as soon as possible. (Plants break the impact of falling rain, and their roots hold soil in place.) Eroding soil becomes sediment in runoff water, which pollutes waterways. Disturbed soil also encourages the growth of non-native weed species.

Retain thinned, deep-rooted native plants to anchor the soil and maintain slope stability. Generally, tall plants have deep, broad root systems. A goal of fire-wise landscaping is to maximize rooting depth while minimizing fuel volume.

Diana Ruiz

For site-specific advice, contact your local Resource Conservation District (RCD) or the USDA Natural Resources Conservation Service (NRCS). For recommendations of native grasses for erosion control, contact the California Native Grasslands Society. (See the *Resources Directory* insert for contact information.)

Native Plants for Defensible Space Landscaping in the Inland Empire

If you prefer to create a landscape of native, low water-use plants, use these lists to design a yard that is fire-wise. Maintenance is essential; dead and dry plant material must be removed during dry, summer dormancy. Some native plants cannot tolerate irrigation during their summer dormancy, so may die if watered too frequently. Some need only infrequent, deep watering to remain hydrated during the dry summer and fall. The low-growing, low-fuel volume plants are suitable for Zone 1 (0-30 ft.) and beyond. Larger shrubs and trees, for Zone 2 (30-100+ ft.), must be widely spaced (see diagram on previous page).

Shrubs for Zone 2

Shrubs that need or tolerate water during summer.

Carpenteria, *Carpenteria californica*
Western redbud, *Cercis occidentalis*
Toyon, *Heteromeles arbutifolia*
Nevin's barberry, *Mahonia nevinii*
Coffeeberry, *Rhamnus californica*
Golden current, *Ribes aureum.*
California wild rose, *Rosa californica*
Western bridalwreath, *Spiraea douglasii*
Squawbush, *Rhus trilobata*

UDSA-NRCS PLANTS Database
Coffeeberry

Shrubs that do not usually tolerate water during summer.

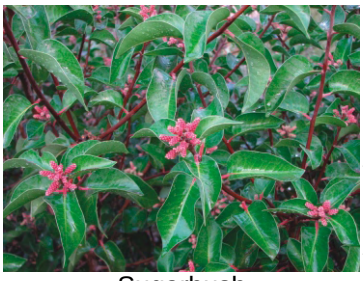
Low shrubs

Bladder pod, *Isomeris arborea*
Bush monkeyflower, *Mimulus aurantiacus*
Chaparral honeysuckle, *Lonicera subspicata*
Hollyleaf redberry, *Rhamnus illicifolia*
Redberry, *Rhamnus crocea*
Yellow bush-penstemon, *Keckiella antirrhinoides*

Paul Aigner
Yellow bush-penstemon

Tall, deep-rooted shrubs that stay green during summer.

Bigberry manzanita, *Arctostaphylos glauca*
Thick-leaved lilac, *Ceanothus crassifolius*
Buck brush, *Ceanothus cuneatus*
Hairy California lilac, *Ceanothus oliganthus*
Mountain mahogany, *Cercocarpus betuloides*
Laurel sumac, *Malosma laurina*
Scrub oak, *Quercus berberidifolia*
Sugarbush, *Rhus ovata*
Lemonade berry, *Rhus integrifolia*
California Flannel bush, *Fremontodendron californicum*


Arlee M.Montalvo
Sugarbush

Trees for Zone 2

Trees that tolerate occasional water during summer.

Catalina cherry, *Prunus illicifolia* ssp. *Lyonii*
Coast live oak, *Quercus agrifolia*
Valley oak, *Quercus lobata*
Engelman oak, *Quercus engelmannii*

Trees that need water during summer.

Big leaf maple, *Acer macrophyllum*
White alder, *Alnus rombifolia*
So. California walnut, *Juglans californica*
California sycamore, *Platanus racemosa*
California black oak, *Quercus kelloggii*
Canyon live oak, *Quercus chrysolepis*
Willows: *Salix laevigata, S. gooddingii*
California bay laurel, *Umbellularia californica*

J. S. Peterson @ UDSA-NRCS
Big leaf maple

Low-growing, (low fuel volume) Plants for Zones 1 and 2

Perennial herbs that tolerate or need water during summer

Yarrow, *Achillea millifolium*
Columbine, *Aquilegia formosa*
Douglas iris, *Iris douglasiana*
Deer grass, *Muhlenbergia rigens*
Calif. blue-eyed grass, *Sisyrinchium bellum*
Meadow rue, *Thalictrum fendleri* var. *polycarpum*
Yerba mansa, *Anemopsis californica*
Coral bells, *Heuchera* ssp.
Common monkey flower, *Mimulus guttatus*
Scarlet bugler, *Penstemon centranthifolius*
California goldenrod, *Solidago californica*
Hedge nettle, *Stachys bullata*
Slender sedge, *Carex praegracilis*
Narrow-leaved milkweed, *Asclepias fascicularis*

Arlee M.Montalvo
Narrow-leaved milkweed

Succulents, Ground Covers, and Low Shrubs

Keep hydrated; if needed, water monthly during summer.

San Diego sedge, *Carex spissa*
Wild lilac, *Ceanothus griseus 'horizontalis'*
California fuchsia, *Epilobium canum =Zauschneria*
Golden yarrow, *Eriophyllum confertiflorum*
Lance-leaved live-forever, *Dudleya lanceolata*
Chalk dudleya, *Dudleya pulverulenta*
Parry's nolina, *Nolina parryi*
Creeping sage, *Salvia sonomensis*
Creeping snowberry, *Symphoricarpos mollis*
Chaparral yucca, *Yucca whipplei = Hesperoyucca whipplei*
Valley cholla, *Opuntia parryi*
Coastal prickly pear, *Opuntia littoralis*

Arlee M.Montalvo
Chaparral yucca

Annuals or summer-dormant perennials

No need for water during summer. There is little, if any, plant material above ground to burn.

California poppy, *Eschscholzia californica*
Larkspurs, delphinium, *Delphinium parryi, D.cardinale*
Wild Canterbury-bell, *Phacelia minor*
California figwort, *Scrophularia californica*
Baby blue eyes, *Nemophila menziesii*
Royal penstemon, *Penstemon spectabilis*
Lupine, *Lupinus* species *(L. bicolor, L. succulentus, L. truncatus, L. sparsiflorus*)

Arlee M.Montalvo
Baby blue eyes

Habitat Land Stewards

If you live near conservation easement land or a waterway, there are ways that you can help. Be observant of activities that might be harmful to your nearby habitat lands, or form a *habitat-watch* group in your neighborhood. Like a neighborhood-watch, property owners help look out for neighborhood habitat and waterways, report illegal activity, and help educate neighbors about human impacts. For help forming a *habitat-watch* group, contact your local Resource Conservation District or the Riverside Land Conservancy.

RCRCD
RIVERSIDE-CORONA RESOURCE CONSERVATION DISTRICT

This publication was developed by the Riverside-Corona Resource Conservation District. www.RCRCD.com
1-07

All programs and services are provided without regard for race, religion, gender, national origin, and handicap.
Printed on recycled paper

KEEP RIVERSIDE CLEAN & BEAUTIFUL

teaching, serving and conserving

WARD 2 BEAUTIFICATION PROJECT

Volunteer for Litter Cleanups and Graffiti Abatement

SATURDAY • FEB 6 • 2010

From 8:00 a.m. to 11:00 a.m.

LINCOLN PARK

4261 Park Ave. Riverside, CA 92507

B.Y.O.W.B. - Bring Your Own Water Bottle

… KRCB will provide refills, & all project tools

No sandals or flip-flops; must wear long pants

Receive community service hours

MUST RSVP! SIGN UP NOW TO VOLUNTEER:

Keep Riverside Clean & Beautiful • 3985 University Ave. • Riverside, CA 92501 • fax 951.683.2670

Business/Organization: _____

Name: _____

Address: _____

City: _____ **Zip:** _____

Phone: _____ **Fax:** _____

Email: _____

# of Total Volunteers: _____ **# of Volunteers Under 18:** _____

For project information contact Tijana: 951.683.7100 x212, or tquilici@riverside-chamber.com

For Connections, Information & Access to Business Opportunities

Contact the Greater Riverside Chambers of Commerce at: **951.683.7100**

Keep Riverside Clean & Beautiful is a community program sponsored by the City of Riverside Public Works Department and the Greater Riverside Chambers of Commerce

Our Mission… To instill a sense of community pride by creating partnerships that work toward the beautification of the City

Helpful telephone numbers and links:

Riverside County Water Agencies

City of Banning	(951) 922-3130
City of Beaumont/Cherry Valley	(951) 845-9581
City of Blythe	(760) 922-6161
City of Coachella	(760) 398-3502
City of Corona	(951) 736-2263
City of Hemet	(951) 765-3710
City of Norco	(951) 270 5607
City of Riverside Public Works	(951) 351-6140
City of San Jacinto	(951) 654-4041
Coachella Valley Water District	(760) 398-2651
Desert Water Agency (Palm Springs)	(760) 323-4971
Eastern Municipal Water District	(951) 928-3777
Elsinore Valley Municipal Water District	(951) 674 3146
Elsinore Water District	(951) 674-2168
Farm Mutual Water Company	(951) 244-4198
Idyllwild Water District	(951) 659-2143
Indio Water Authority	(760) 391-4129
Jurupa Community Services District	(951) 685-7434
Lee Lake Water	(951) 658-3241
Mission Springs Water	(760) 329-6448
Rancho California Water District	(951) 296-6900
Ripley, CSA #62	(760) 922-4951
Riverside Co. Service Area #51	(760) 227-3203
Rubidoux Community Services District	(951) 684-7580
Valley Sanitary District	(760) 347-2356
Western Municipal Water District	(951) 789-5000
Yucaipa Valley Water District	(909) 797-5117

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555 or e-mail us at
fcnpdes@rcflood.org

- Riverside County Flood Control and Water Conservation District
  www.rcflood.org

Online resources include:

- California Storm Water Quality Association
  www.casqa.org
- State Water Resources Control Board
  www.waterboards.ca.gov
- Power Washers of North America
  www.thepwna.org

Stormwater Pollution

What you should know for...

Outdoor Cleaning Activities and Professional Mobile Service Providers

Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

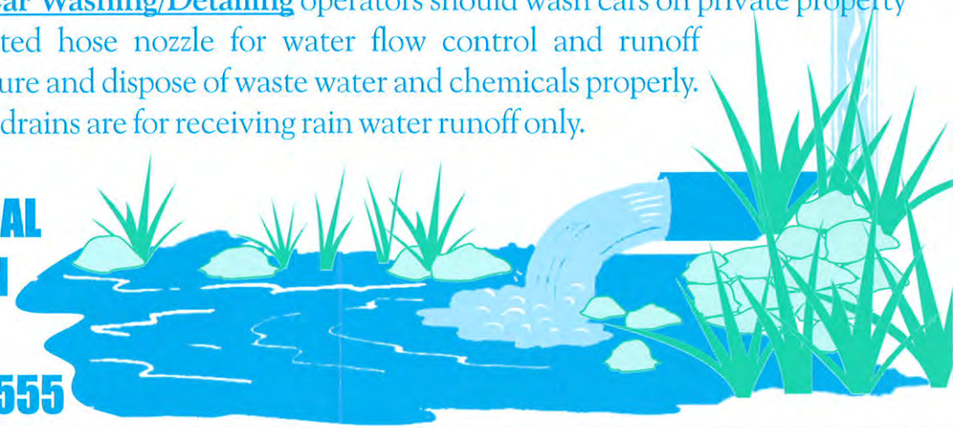
Do you know where street flows actually go?

Storm drains are NOT connected to sanitary sewer systems and treatment plants!

The primary purpose of storm drains is to carry rain water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** *Always* have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets, using drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Remember, storm drains are for receiving rain water runoff only.

REPORT ILLEGAL STORM DRAIN DISPOSAL 1-800-506-2555



Help Protect Our Waterways!

Use these guidelines for Outdoor Cleaning Activities and Wash Water Disposal

Did you know that disposing of pollutants into the street, gutter, storm drain or body of water is *PROHIBITED* by law and can result in stiff penalties?

Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. ***Each of us*** can do our part to keep storm water clean by using the suggested BMPs below:

Simple solutions for both light and heavy duty jobs:

Do...consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

Do...prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose of ***small amounts*** of power washing waste water on to landscaped, gravel or unpaved surfaces.

Do...check your local sanitary sewer agency's policies on wash water disposal regulations before disposing wash water to the sewer. (See list on reverse side)

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do...check to see if local ordinances prevent certain activities.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.

Report illegal storm drain disposal,
Call Toll Free
1-800-506-2555

Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them for being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.

When cleaning surfaces with a ***high-pressure washer*** or ***steam cleaner***, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks. Water is a precious resource, don't let it flow freely and be sure to shut it off in between uses.

Screening Wash Water

Conduct thorough dry cleanup before washing exterior surfaces, such as buildings and decks ***with loose paint***, sidewalks or plaza areas. Keep debris from entering the storm drain after cleaning by first passing the wash water through a "20 mesh" or finer screen to catch the solid materials, then dispose of the mesh in a refuse container. Do not let the remaining wash water enter a street, gutter or storm drain.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or other appropriate materials.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Concrete/Coring/Saw Cutting and Drilling Projects

Protect any down-gradient inlet by using dry activity techniques whenever possible. If water is used, minimize the amount of water used during the coring/drilling or saw cutting process. Place a barrier of sandbags and/or absorbent berms to protect the storm drain inlet or watercourse. Use a shovel or wet vacuum to remove the residue from the pavement. Do not wash residue or particulate matter into a storm drain inlet or watercourse.

Helpful telephone numbers and links:

WATER AGENCY LIST in Riverside County

City of Banning	(951) 922-3130
City of Beaumont	(951) 769-8520
City of Blythe	(760) 922-6161
City of Coachella	(760) 398-3502
Coachella Valley Water District	(760) 398-2651
City of Corona	(951) 736-2259
Desert Center, CSA #51	(760) 227-3203
Eastern Municipal Water District	(951) 928-3777
Elsinore Valley MWD	(951) 674-3146
Farm Mutual Water Company	(951) 244-4198
City of Hemet	(951) 765-3712
Idyllwild Water District	(951) 659-2143
Jurupa Community Services District	(951) 360-8795
Lake Hemet MWD	(951) 658-3241
Lee Lake Water District	(951) 277-1414
March Air Force Base	(951) 656-7000
Mission Springs Water District	(760) 329-6448
City of Palm Springs	(760) 323-8253
Rancho Caballero	(951) 780-9272
Rancho California Water District	(951) 296-6900
Ripley, CSA #62	(760) 922-4951
City of Riverside	(951) 351-6170
Rubidoux Services District	(951) 684-7580
Silent Valley Club, Inc	(951) 849-4501
Valley Sanitary District	(760) 347-2356
Western Municipal Water District	(951) 789-5000
Yucaipa Valley Water District	(909) 797-5117

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555 or online at
www.rcflood.org

Online resources include:

- Riverside County Flood Control and Water Conservation District
  www.rcflood.org
- California Storm Water Quality Association
  www.casqa.org
- State Water Resources Control Board
  www.swrcb.ca.gov/
- Power Washers of North America
  www.thepwna.org

StormWater Pollution

What you should know for...

OUTDOOR CLEANING ACTIVITIES AND PROFESSIONAL MOBILE SERVICE PROVIDERS

Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

Do you know where street flows actually go?

Storm Drains are NOT connected to sanitary sewer systems and treatment plants!

The primary purpose of storm drains is to carry rain water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

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Help Protect Our Waterways!

Use These Guidelines For Outdoor Cleaning Activities and Wash Water Disposal

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Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose *small amounts* of power washing waste water to landscaped, gravel or unpaved surfaces.

Do...check with your local sanitary sewer agency's policies on wash water disposal regulations. (See list on reverse side).

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.

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Using Cleaning Agents

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When cleaning surfaces with a *high-pressure washer* or *steam cleaner*, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks.

Screening Wash Water

A thorough dry cleanup before washing exterior surfaces, such as buildings and decks *without loose paint*, sidewalks, or plaza areas should be sufficient to protect receiving waters. Keep debris from entering the storm drain after cleaning by first passing the wash water first through a “20 mesh” or finer screen to catch the solid materials, then disposing the mesh in a refuse container.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or rubber mats.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Equipment and Supplies

For special materials, equipment and supplies:

- New Pig — (800) 468-4647
- Lab Safety Supply — (800) 356-0783
- C&H — (800) 558-90966
- W.W. Grainger — (800) 994-9174
- Cleaning Equipment Trade Association — (800) 441-0111

For Information:

For more information on the General Industrial Storm Water Permit contact:

State Water Resources Control Board (SWRCB)
(916) 657-1146 or www.swrcb.ca.gov/ or, at your Regional Water Quality Control Board (RWQCB).

Santa Ana Region (8)
California Tower
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
(909) 782-4130

San Diego Region (9)
9771 Clairemont Mesa Blvd., Ste. A
San Diego, CA 92124
(619) 467-2952

Colorado River Basin Region (7)
73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491

SPILL RESPONSE AGENCY:
HAZ-MAT: (909) 358-5055
HAZARDOUS WASTE DISPOSAL: (909) 358-5055
RECYCLING INFORMATION: 1-800-366-SAVE
TO REPORT ILLEGAL DUMPING OR A CLOGGED STORM DRAIN: 1-800-506-2555

To order additional brochures or to obtain information on other pollution prevention activities, call:
(909) 955-1111.

StormWater
CleanWater
PROTECTION PROGRAM

Riverside County gratefully acknowledges the State Water Quality Control Board and the American Public Works Association, Storm Water Quality Task Force for the information provided in this brochure.

DID YOU KNOW . . .

YOUR FACILITY MAY NEED A STORM WATER PERMIT?

Many industrial facilities and manufacturing operations must obtain coverage under the Industrial Activities Storm Water General Permit

FIND OUT
IF YOUR FACILITY MUST OBTAIN A PERMIT

StormWater Pollution . . . What you should know

Riverside County has two drainage systems - sanitary sewers and storm drains. The storm drain system is designed to help prevent flooding by carrying excess rainwater away from streets. Since the storm drain system does not provide for water treatment, it also serves the *unintended* function of transporting pollutants directly to our waterways.

Unlike sanitary sewers, storm drains are not connected to a treatment plant - they flow directly to our local streams, rivers and lakes.

In recent years, awareness of the need to protect water quality has increased. As a result, federal, state, and local programs have been established to reduce polluted stormwater discharges to our waterways. The emphasis of these programs is to prevent stormwater pollution since it's much easier, and less costly, than cleaning up "after the fact."

National Pollutant Discharge Elimination System (NPDES)

In 1987, the Federal Clean Water Act was amended to establish a framework for regulating industrial stormwater discharges under the NPDES permit program. In California, NPDES permits are issued by the State Water Resources Control Board (SWRCB) and the nine (9) Regional Water Quality Control Boards (RWQCB). In general, certain industrial facilities and manufacturing operations must obtain coverage under the Industrial Activities Storm Water General Permit if the type of facilities or operations falls into one of the several categories described in this brochure.

How Do I Know If I Need A Permit?

Following are ***general descriptions*** of the industry categories types that are regulated by the Industrial Activities Storm Water General Permit. Contact your local Region Water Quality Control Board to determine if your facility/operation requires coverage under the Permit.

➜ Facilities such as cement manufacturing; feedlots; fertilizer manufacturing; petroleum refining; phosphate manufacturing; steam electric power generation; coal mining; mineral mining and processing; ore mining and dressing; and asphalt emulsion;

➜ Facilities classified as lumber and wood products (except wood kitchen cabinets); pulp, paper, and paperboard mills; chemical producers (except some pharmaceutical and biological products); petroleum and coal products; leather production and products; stone, clay and glass products; primary metal industries; fabricated structural metal; ship and boat building and repairing;

➜ Active or inactive mining operations and oil and gas exploration, production, processing, or treatment operations;

➜ Hazardous waste treatment, storage, or disposal facilities;

➜ Landfills, land application sites and open dumps that receive or have received any industrial waste; unless there is a new overlying land use such as a golf course, park, etc., and there is no discharge associated with the landfill;

➜ Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards;

➜ Steam electric power generating facilities, facilities that generate steam for electric power by combustion;

➜ Transportation facilities that have vehicle maintenance shops, fueling facilities, equipment cleaning operations, or airport deicing operations. This includes school bus maintenance facilities operated by a school district;

➜ Sewage treatment facilities;

➜ Facilities that have areas where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water.

How do I obtain coverage under the Industrial Activities Storm Water General Permit?

Obtain a permit application package from your local Regional Water Quality Control Board listed on the back of this brochure or the State Water Resources Control Board (SWRCB). Submit a completed Notice of Intent (NOI) form, site map and the appropriate fee ($250 or $500) to the SWRCB. Facilities must submit an NOI thirty (30) days prior to beginning operation. Once you submit the NOI, the State Board will send you a letter acknowledging receipt of your NOI and will assign your facility a waste discharge identification number (WDID No.). You will also receive an annual fee billing. These billings should roughly coincide with the date the State Board processed your original NOI submittal.

What are the requirements of the Industrial Activities Storm Water General Permit?

The basic requirements of the Permit are:

1. The facility must eliminate any non-stormwater discharges or obtain a separate permit for such discharges.

2. The facility must develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must identify sources of pollutants that may be exposed to stormwater. Once the sources of pollutants have been identified, the facility operator must develop and implement Best Management Practices (BMPs) to minimize or prevent polluted runoff.

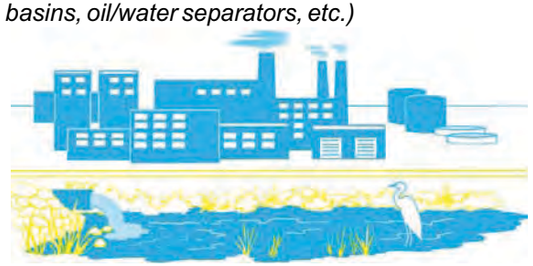
   Guidance in preparing a SWPPP is available from a document prepared by the California Storm Water Quality Task Force called the California Storm Water Best Management Practice Handbook.

3. The facility must develop and implement a Monitoring Program that includes conducting visual observations and collecting samples of the facility's storm water discharges associated with industrial activity. The General Permit requires that the analysis be conducted by a laboratory that is certified by the State of California.

4. The facility must submit to the Regional Board, every July 1, an annual report that includes the results of its monitoring program.

A Non-Storm Water Discharge is... *any discharge to a storm drain system that is not composed entirely of storm water. The following non-storm water discharges are authorized by the General Permit: fire hydrant flushing; potable water sources, including potable water related to the operation, maintenance, or testing of potable water systems; drinking fountain water; atmospheric condensates including refrigeration, air conditioning, and compressor condensate; irrigation drainage; landscape watering; springs; non-contaminated ground water; foundation or footing drainage; and sea water infiltration where the sea waters are discharged back into the sea water source.*

A BMP is . . . *a technique, process, activity, or structure used to reduce the pollutant content of a storm water discharge. BMPs may include simple, non-structural methods such as good housekeeping, staff training and preventive maintenance. Additionally, BMPs may include structural modifications such as the installation of berms, canopies or treatment control (e.g. setting basins, oil/water separators, etc.)*



WARNING*: There are significant penalties for non-compliance: a minimum fine of $5,000 for failing to obtain permit coverage, and, up to $10,000 per day, per violation plus $10 per gallon of discharge in excess of 1,000 gallons.*

Saltwater Pools

- Salt water pools, although different from regular pools, are in fact, sanitized using chlorine. A salt-chlorine generator separates the chlorine and sodium molecules in salt and reintroduces them into the pool water. The same harmful effects of chlorine still apply.
- A salt water pool is still maintained with chemicals such as Muriatic acid, soda ash and sodium carbonate to help keep a proper pH, total Alkalinity, Calcium Hardness and Stabilizer levels.

- It may be illegal to discharge salt water to land. The salt may kill plants and the build-up of salt in soil puts animals, plants, and groundwater at risk. Consult your city representatives to determine local requirements regarding salt water drainage.

NEVER put unused chemicals into the trash, onto the ground or down a storm drain.

IMPORTANT: The discharge of pollutants into the street, gutter, storm drain system or waterways - without a permit or waiver - is strictly prohibited by local ordinances, state and federal law. Violations may result in monetary fines and enforcement actions.

Helpful telephone numbers and links

Riverside County Water Agencies:

City of Banning	(951) 922-3130
City of Beaumont/Cherry Valley	(951) 845-9581
City of Blythe	(760) 922-6161
City of Coachella	(760) 398-3502
City of Corona	(951) 736-2263
City of Hemet	(951) 765-3710
City of Norco	(951) 270 5607
City of Riverside Public Works	(951) 351-6140
City of San Jacinto	(951) 654-4041
Coachella Valley Water District	(760) 398-2651
Desert Water Agency (Palm Springs)	(760) 323-4971
Eastern Municipal Water District	(951) 928-3777
Elsinore Valley Municipal Water District	(951) 674 3146
Elsinore Water District	(951) 674-2168
Farm Mutual Water Company	(951) 244-4198
Idyllwild Water District	(951) 659-2143
Indio Water Authority	(760) 391-4129
Jurupa Community Services District	(951) 685-7434
Lee Lake Water	(951) 658-3241
Mission Springs Water	(760) 329-6448
Rancho California Water District	(951) 296-6900
Ripley, CSA #62	(760) 922-4951
Riverside Co. Service Area #51	(760) 227-3203
Rubidoux Community Services District	(951) 684-7580
Valley Sanitary District	(760) 347-2356
Western Municipal Water District	(951) 789-5000
Yucaipa Valley Water District	(909) 797-5117

CALL 1-800-506-2555 to:

- Report clogged storm drains or illegal storm drain disposal from residential, industrial, construction and commercial sites into public streets, storm drains and/or water bodies.
- Find out about our various storm drain pollution prevention materials.
- Locate the dates and times of Household Hazardous Waste (HHW) Collection Events.
- Request adult, neighborhood, or classroom presentations.
- Locate other County environmental services.
- Receive grasscycling information and composting workshop information.

Or visit our
Riverside County Flood Control and Water Conservation District
website at: www.rcflood.org

Other links to additional storm drain pollution information:

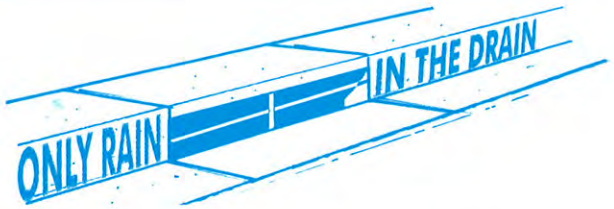
- County of Riverside Environmental Health: www.rivcoeh.org
- State Water Resources Control Board: www.waterboards.ca.gov
- California Stormwater Quality Association: www.casqa.org
- United States Environmental Protection Agency (EPA): www.epa.gov/compliance/assistance (compliance assistance information)

Riverside County's, "Only Rain Down the Storm Drain" Pollution Prevention Program gratefully acknowledges the Bay Area Stormwater Management Agencies Association and the Cleaning Equipment Trade Association for information provided in this brochure.

Guidelines for Maintaining your...

Swimming Pool, Jacuzzi and Garden Fountain

Where does the water go?



Pool, Jacuzzi and Fountain wastewater and rain water runoff (also called stormwater) that reach streets can enter the storm drain and be conveyed directly into local streams, rivers and lakes.

A storm drain's purpose is to prevent flooding by carrying rain water away from developed areas. Storm drains are not connected to sanitary sewers systems and treatment plants!

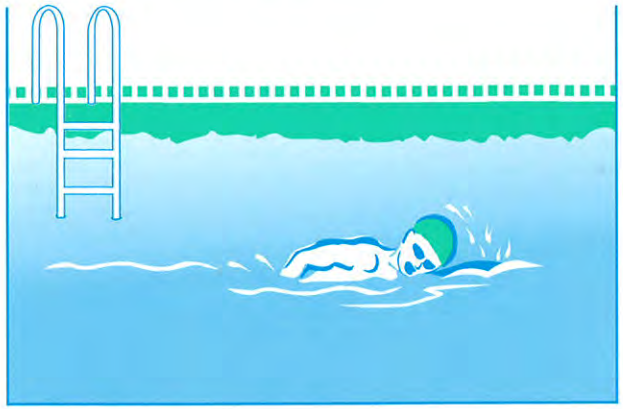
Wastewater, from residential swimming pools, Jacuzzis, fishponds and fountains, often contains chemicals used for sanitizing or cleansing purposes. Toxic chemicals (such as chlorine or copper-based algaecides) may pollute the environment when discharged into a storm drain system.

The Cities and County of Riverside have adopted ordinances that prohibit the discharge of wastewater to the street and storm drain system.

Discharge Regulations

Regulatory requirements for discharging wastewater from your pool may differ from city to city. Chlorinated water should not be discharged into the street, storm drain or surface waters. Check with your water agency to see if disposal to the sanitary sewer line is allowed for pool discharges (see reverse for Riverside County sewer agencies).

If allowed, a hose can be run from the pool Jacuzzi, or fountain to the private sewer cleanout, washing machine drain or a sink or bathtub.



If you cannot discharge to the sewer, you may drain your fountain, pool, or jacuzzi to your landscaping by following these guidelines:

First, reduce or eliminate solids (e.g. debris, leaves or dirt) in the pool water and allow the chemicals in the pool water to dissipate before draining the pool (this could take up to 7 days, verify using a home pool test kit).

Second, slowly drain to a landscaped area away from buildings or structures. Control the flow to prevent soil erosion; it may take more than one day to empty. Do not allow sediment to enter the street, gutter or storm drain.

Maintenance & Chemicals

Cleaning Filters

Filter rinse water and backwash must be discharged to the sanitary sewer, on-site septic tank and drain field system (if properly designed and adequately sized), or a seepage pit. Alternatively, rinse water or backwash may be diverted to landscaped or dirt areas. Filter media and other non-hazardous solids should be picked up and disposed of in the trash.

Algaecides

Avoid using copper-based algaecides unless absolutely necessary. Control algae with chlorine, organic polymers or other alternatives to copper-based pool chemicals. Copper is a heavy metal that can be toxic to aquatic life when you drain your pool.

Chemical Storage and Handling

- Use only the amount indicated on product labels
- Store chlorine and other chemicals in a covered area to prevent runoff. Keep out of reach of children and pets.
- Chlorine kits, available at retail swimming pool equipment and supply stores, should be used to monitor the chlorine and pH levels before draining your pool.
- Chlorine and other pool chemicals should never be allowed to flow into the gutter or storm drain system.

Take unwanted chemicals to a Household Hazardous Waste (HHW) Collection Event. There's no cost for taking HHW items to collection events – it's FREE! Call **1-800-506-2555** for a schedule of HHW events in your community.

For more information,
please call the
Riverside County's
"Only Rain Down the Storm Drain"
Pollution Prevention Program
at 1-800-506-2555 or
www.rcflood.org

or

To Report A Sewage Spill:
During normal business hours
(8:00 a.m to 5:00 p.m), call
Riverside County Department of
Environmental Health
at 951-358-5172 or 1-800-304-2226
www.rivcoeh.org

After business hours, on weekends
or holidays, call toll free
1-800-506-2555

For emergencies, dial 911.

www.NOWRA.ORG - A website providing resources and education on the design and maintenance of septic tank systems.

www.epa.gov/owm/septic - Including septic tank information, the Environmental Protection Agency has a large E-vault of environmental information and resources.

The Riverside County "Only Rain Down the Storm Drain" Pollution Prevention Program gratefully acknowledges Orange County's Storm Water Program for their contribution to this brochure.

Stormwater Pollution

What you should know...

Tips for Maintaining a Septic Tank System

Water quality responsibility begins at YOUR front door.

Tips for Maintaining a Septic Tank System

Households that are not served by public sewers usually depend on a septic tank system* to treat and dispose of wastewater. A well designed, installed and regularly maintained septic system can provide years of reliable service. However, when these systems fail to operate properly, significant damage can occur to property and the environment. The homeowner is responsible for these damages and may be subject to fines. Therefore, it is important to follow these simple tips when using a septic tank system:

Conserve Water

The more wastewater produced, the more the soil must absorb. By conserving water, the life of the drain field will be extended and the chance of a system failure is decreased.

Reduce your water use by:

- Using water saving devices
- Repairing leaky faucets and plumbing fixtures
- Reducing toilet reservoir volume or flow
- Taking shorter showers
- Washing only full loads of dishes and laundry
- Limit the number of highwater use activities done at the same time.

Never Flush Harmful Materials Into The Septic Tank

Grease, cooking oils, newspaper, paper towels, rags, coffee grounds, sanitary napkins and cigarettes do not easily decompose in the tank. Chemicals such as solvents, soils, unused prescriptions, over-the-counter medications, paints and pesticides are harmful to the system's operation and may pollute the groundwater. For information on the proper disposal of household hazardous waste, call toll free 1-800-506-2555. Also, never use septic tank additives, commercial septic tank cleaners, yeast, sugar, etc. These products are not necessary and some may be harmful to your system.

Keep Runoff Away From The System

Water from surfaces such as roofs, driveways or patios should be diverted away from the septic tank and drain field area.

Protect The System From Damage

Don't park, pave or put livestock or heavy objects, equipment or machinery over the drainfield. The pressure can compact the soil or damage pipes. Also check your septic system map prior to constructing buildings or a pool on the property. The area over the absorption field and tank should be left undisturbed with only grass on top. Trees or shrubs, which may clog and damage the drain, should be removed from the area.

Keep Records

Chart the location of your septic tank and keep up-to-date service and repair records for future reference.

Inspect The System

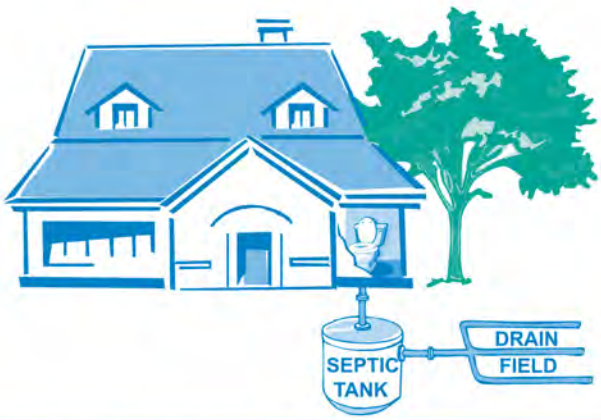
Monitor the system yearly to ensure it is not at an "early warning level." Inspect the drain field and down slope areas for odors, wet spots, or surfacing of sewage. This may be an early indication of a problem with the system. Also, have the system inspected by a licensed septic tank professional every three to five years.

Pump The Tank When Needed

Routine pumping can prevent failures, such as clogging and backup into the home. Never pump full or failing septic systems to the street or storm drain.

Never Enter The Septic Tank

Poisonous gases or the lack of air can be fatal. A certified professional should complete any work to the tank.



* Contact your local collection agency or city for assistance in determining if your home is served by a septic tank.

Stormwater Pollution Found in Your Area!

This is not a citation.

This is to inform you that our staff found the following pollutants in the storm sewer system in your area. This storm sewer system leads directly to

_____ .

- ❑ Motor oil
- ❑ Oil filters
- ❑ Antifreeze/ transmission fluid
- ❑ Paint
- ❑ Solvent/degreaser
- ❑ Cooking grease
- ❑ Detergent
- ❑ Home improvement waste (concrete, mortar)
- ❑ Pet waste
- ❑ Yard waste (leaves, grass, mulch)
- ❑ Excessive dirt and gravel
- ❑ Trash
- ❑ Construction debris
- ❑ Pesticides and fertilizers
- ❑ Other

_____

For more information or to report an illegal discharge of pollutants, please call:

Riverside County Residents, Call . . .
1-800-506-2555

WHEN IT RAINS
IT DRAINS

EPA
United States
Environmental Protection
Agency

www.epa.gov/npdes/stormwater

EPA 833-F-03-002
April 2003

Stormwater runoff is precipitation from rain or snowmelt that flows over the ground. As it flows, it can pick up debris, chemicals, dirt, and other pollutants and deposit them into a storm sewer system or waterbody.

Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

Remember: Only Rain Down the Drain

To keep the stormwater leaving your home or workplace clean, follow these simple guidelines:

- Use pesticides and fertilizers sparingly
- Repair auto leaks.
- Dispose of household hazardous waste, used auto fluids (antifreeze, oil, etc.), and batteries at designated collection or recycling locations.
- Clean up after your pet.
- Use a commercial car wash or wash your car on a lawn or other unpaved surface.
- Sweep up yard debris rather than hosing down areas. Compost or recycle yard waste when possible.
- Clean paint brushes in a sink, not outdoors. Properly dispose of excess paints through a household hazardous waste collection program.
- Sweep up and properly dispose of construction debris like concrete and mortar.

STREAM STABILIZATION FACTS

for Home and Property Owners in Riverside County

Homeowners living adjacent to streams, lakes and rivers may be impacted by bank erosion or sediment deposition that can occur due to natural processes or man-made causes. Homeowner efforts to mitigate impacts to their property from erosion or sedimentation can negatively affect native plants and animals, lessen a watercourse's ability to convey storm flows, cause erosion or sedimentation problems on other properties and/or cause flooding. Below is some guidance regarding actions a homeowner should take before attempting to protect their property:

- In some cases, any alteration of a watercourse may be prohibited by local land-use regulations, e.g., a "drainage easement", "flowage easement", "floodplain" or "Environmental Constraint Sheet". You should contact your local City or County building or grading department to determine if these limitations apply to watercourses in or adjacent to your property.

- In cases where alterations are not expressly prohibited, grading, filling or otherwise altering a watercourse - even those that flow intermittently, such as dry washes that only flow when it rains – may require approval from one or more of the following regulating agencies:

REGULATING AGENCY	POTENTIAL REGULATORY PERMIT	WHERE TO CONTACT
Local (City, County) land use authority *	• Grading Permit • Floodplain Review	White pages under City/County Government
California Department of Fish and Game*	• Fish and Game Section 1602 Agreements	www.dfg.ca.gov
US Army Corps of Engineers*	• Clean Water Act Section 404 Permit	www.usace.army.mil
California State Water Resources Control Board*	• Clean Water Act Section 401 Water Quality Certification or Waste Discharge Requirements	www.swrcb.ca.gov

*Fees may be applicable.

- Property owners should **CONTACT EACH REGULATING AGENCY** (listed above) for the necessary approval(s) **BEFORE**:

1. ***Removing*** soil, rock or plant material from a streambed or the bank of a stream;

(over)

More on Stream Stabilization

2. ***Placing*** any waste, material (dirt, rubble) or structures (dams, revetments) on a stream bank or within a stream;

3. ***Diverting, obstructing, or otherwise modifying*** the bed, channel, or bank of any river, stream or lake;

4. ***Dumping*** *or* ***depositing*** debris, liquid or solid waste, soil, manure or other material that may be conveyed into a wash, stream, river or lake; or

5. ***Armoring*** *or* ***stabilizing*** a stream bank against stream bank erosion.

Some other examples of regulated stream alteration activities include vegetation removal or construction of road crossings or corrals. Property owners are responsible for obtaining all necessary approvals prior to commencing any of the aforementioned activities.

- *The Natural Resources Conservation Service (NRCS)* makes onsite recommendations (currently free of charge) to private land owners for effective erosion control. For help in protecting your property from stream erosion please contact:

NATURAL RESOURCES CONSERVATION SERVICE (NRCS)	**CONTACT**	**PHONE NO.**
Riverside County (West of the San Jacinto Mtns.)	Robert Hewitt	(951) 654-7139
Beaumont and Banning Area	Jim Earsom	(909) 799-7407
Desert Area	Sam Aslam	(760) 347-7658
Blythe	Sam Cobb	(760) 922-3446

- ***YOU*** **can help protect water quality**:
  Prevent trash, debris, manure and waste of any kind from washing off home sites and streets into gutters, storm drains and dry watercourses. During storms, these watercourses can convey pollution into more sensitive streams and rivers.

County-wide Service Information

- Household hazardous wastes (oil-based paints, pesticides, antifreeze, motor oil, batteries and fluorescent bulbs) must never be disposed of in or near watercourses. You may find your nearest household hazardous waste disposal site by calling **(800) 304-2226 or on the web at www.rivcowm.org**

- Report illegal grading or dumping in watercourses by contacting your City or County Code Enforcement Department, or call **(800) 506-2555.**

- Report a non-emergency crime such as dumping by contacting your City Police or County Sherriff's Department, or call **(800) 506-2555.**

Clean and healthy creeks, river, lakes and streams are important to Riverside County. However, equestrian enthusiasts and common outdoor equestrian activities can lead to water pollution, if owners are not careful.

Horse waste and equestrian care products can be washed into streets and storm drains, when residents are not careful. Unlike sanitary sewers (from sinks and toilets), storm drains flow directly (untreated) to our creeks, rivers, lakes and streams.

You would never put animal waste or products into our creeks, river, lakes or streams, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution while grooming or feeding horses, or constructing a stable.

Resources

Contact your city's storm water representative for any applicable local ordinances.

For more information,
please call the Riverside County's
"Only Rain Down the Storm Drain"
1-800-506-2555
or visit the website at
www.rcflood.org

- Report a spill, an illegal storm drain disposal or clogged storm drains.
- Obtain pollution prevention information for Riverside County Residents, Businesses, Developers, Industries and Municipalities.
- Schedule pollution prevention education for adults, groups, or school presentations.
- Locate Household Hazardous Waste Collection Centers.

**FOR SPILL EMERGENCIES,
PLEASE CALL 911**

Riverside County gratefully acknowledges the Orange County Storm Water Program for the information provided in this brochure.

StormWater Pollution

What you should know...

...ONLY RAIN...
DOWN THE STORM DRAIN

Environmental responsibility begins with YOU.

Never allow horse waste or care products to enter the street or storm drain.

Grooming

- Use less-toxic alternatives for grooming. Even biodegradable products can be harmful to humans, marine life and the environment. Follow instructions on the products and clean up spills.
- When washing horses, either allow wash water to seep into the ground or wash in an area that is routed to the sanitary sewer. Do not let wash water enter the storm drain or any bodies of water.
- Conserve water by using a spray nozzle with an automatic shut-off. Turn off the water or kink the hose when not in use.

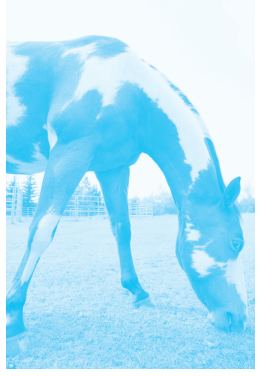
Pasture Management

- Horse holding areas should be swept or shoveled at least once per day. Never hose down these areas! The waste could end up in a stream or storm drain.

- Paddocks should be cleaned at least twice per week during the rainy season and once per week the rest of the year.

Grazing

- Establish healthy and vigorous pastures with at least three inches of leafy material.
- During rainfall, consider indoor feeding, a practice that keeps manure under a roof and away from runoff.



Collection and Storage

- Store animal waste in a sturdy, seepage-free unit that is enclosed or under cover.
- Line waste pits or trenches with an impermeable layer.
- Do not store manure on-site for more than one week.

Use and Disposal

- Compost soiled bedding and manure. See http://compostingcouncil.org for more information.
- Donate composted material to local greenhouses, nurseries and botanical parks.
- Transport manure to topsoil companies or composting centers.

Facility Design

- If you are constructing or re-building a stable, have your engineer check the County's website at www.ocwatersheds.com for information about facility design.

Remember, good land management protects horse health and water quality. A horse property that is managed well can also prevent disputes with neighbors, attract wildlife and make horse care more enjoyable.

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Appendix G. Geotechnical Plan Review/Addendum

GEOTECHNICAL REVIEW OF ROUGH GRADING PLANS, TRACT 31194, MENIFEE, COUNTY OF RIVERSIDE, CALIFORNIA

Prepared For:

WOODSIDE HOMES OF CALIFORNIA

23121 Antonio Parkway, Suite 120
Rancho Santa Margarita, California 92688

January 30, 2004

Project No. 110712-002

Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

Leighton and Associates, Inc.

A LEIGHTON GROUP COMPANY

January 30, 2004

Project No. 110712-002

To: Woodside Homes of California
23121 Antonio Parkway, Suite 120
Rancho Santa Margarita, California 92688

Attention: Mr. Peter Evans

Subject: Geotechnical Review of Rough Grading Plans, Tract 31194, Menifee, County of Riverside, California.

In accordance with your request and authorization, Leighton and Associates, Inc. (Leighton) has completed a geotechnical review of rough grading plans for Tract 31194. The subject site is located southeast of Evans Road and Garbani Road in Menifee, California (see Figure 1). Significant geotechnical issues identified include compressible alluvium, hard rock rippability, rockfall hazards, slope stability and seismicity. This report summarizes our findings, conclusions and preliminary recommendations regarding the geotechnical conditions within the subject site.

If you have any questions regarding this report, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LEIGHTON AND ASSOCIATES, INC.

REGISTERED GEOLOGIST SCOT A. MATHIS No. 2307 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

Scot Mathis, CEG 2307 (Exp. 11/30/04)
Project Geologist

Adam Terronez, RCE 62285
Project Engineer

REGISTERED PROFESSIONAL ENGINEER ADAM X. TERRONEZ NO. 62285 EXP. 9-31-05 CIVIL STATE OF CALIFORNIA

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Leighton

1.0 INTRODUCTION

1.1 Purpose and Scope

The purpose of our geotechnical investigation was to summarize the pertinent, readily available geologic and geotechnical data, obtain additional site specific data, and evaluate this data with respect to the proposed development of the subject site, as depicted on the Tract 31194 rough grading plans (Hunsaker and Associates, 2003, Appendix A).

Our scope of services for the current and previous phases of this investigation included the following items:

- Review of available geologic and geotechnical information.
- Site reconnaissance to observe and document the current surface conditions.
- Drilling of 11 hollow stem auger borings to a maximum depth of approximately 20 feet to assess the general engineering characteristics of the subsurface soils, collect samples for laboratory testing, and determine the depth to groundwater, if encountered.
- Excavation, logging and sampling of 12 test pits to evaluate the engineering characteristics of existing soils and underlying alluvial soils.
- Seismic refraction survey, consisting of 8 seismic lines, to evaluate the excavation characteristics of the on-site rock materials.
- Laboratory testing of selected soil samples to determine insitu moisture and density, plasticity index, compaction characteristics (maximum dry density and optimum moisture), direct shear strength, expansion index, consolidation characteristics, and geochemical characteristics (soluble sulfate, chloride, minimum resistivity, and pH).
- Analysis of site geotechnical conditions including slope stability, liquefaction potential, dynamic settlement potential and rockfall hazard.
- Geotechnical review of Tentative Tract 31194 rough grading plan.
- Preparation of this report, presenting our findings and preliminary recommendations with regards to current site conditions, onsite soil types, seismic design parameters, rock rippability, remedial earthwork, general slope stability, residential foundation design, estimated static and seismically induced ground settlement and preliminary pavement design, as needed.

1.2 Site Location and Description

The subject site is generally located adjacent to the southeast corner of Evans Road and Garbani Road in the Menifee area of Riverside County, California. The location and approximate limits of the site are depicted on the attached Figure 1 (site location map).

During our investigation, several residences and other small buildings were observed to be recently razed in the western portion of the site. The remainder of the site was undeveloped and appeared to be used for agricultural and livestock operations.

Topographically, the central and southeastern portions of the property are relatively flat lying while the northern region of the property is characterized by a steep mountainside. A small, northwest-trending drainage channel extends through the northwestern and central portion of the property. A knoll also exists near the southeast corner of the property. Site elevations range from approximately 1,720 feet above mean sea level (msl) in the northeastern corner of the site to approximately 1,500 feet (msl) at the northwestern portion of the site.

1.3 Proposed Development

Based on the provided rough grading plan (Hunsaker and Associates, 2003) referenced in Appendix A, we understand the proposed development will consist of approximately 492 single-family residences with associated roadways and improvements.

1.4 Project Plans

Our investigation and this report are based on the Tract 31194 Rough Grading Plan by Hunsaker and Associates Irvine, Inc., as referenced in Appendix A. The plans reviewed by Leighton are 40-scale, plotted December 8, 2004, and consist of 23 sheets. The electronic version of the same plans was used as the base map for the Geotechnical Map (Plate 1) presented in this report. The manner in which the plans are sheeted made it difficult to present the geotechnical data in an understandable way. In order to enhance the accessibility of this report, the Geotechnical Map is presented at 100-scale on a single sheet. The design and topographic information are the same on the 40-scale rough grading plan and the 100-scale Geotechnical Map.

2.0 INVESTIGATION AND LABORATORY TESTING

2.1 Test Pits

A backhoe was used on June 6, 2002 to excavate 12 test pits to a maximum depth of approximately 14 feet. The test pits were logged and sampled by a Leighton geologist. The test pit logs are presented in Appendix B and the test pit locations are depicted on the Geotechnical Map (Plate 1).

2.2 Soil Borings

On January 12, 2004, 11 hollow-stem auger soil borings (B-1 through B-11) were advanced to a maximum depth of approximately 20 feet. All borings were terminated in dense granitic bedrock. The borings were sampled and logged by a Leighton geologist. Approximate locations of the borings are depicted on the Geotechnical Map (Plate 1). Boring logs are included in Appendix B.

During the drilling operation, bulk and relatively undisturbed samples were obtained from the borings for laboratory testing and evaluation. The relatively undisturbed samples were obtained utilizing a modified California drive sampler (2⅜-inch inside diameter and 3-inch outside diameter) driven 18 inches, where possible, in general accordance with ASTM Test Method D3550. In addition, standard penetration tests (SPT) were performed using a 2-inch outside diameter (1⅜-inch inside diameter) sampler driven 18 inches, where possible, in general accordance with ASTM Test Method D1586. All samples and SPTs were driven with a 140-pound automatic hammer dropping 30 inches. The number of blows to achieve the last 12 inches of penetration or number of blows with sampling penetration depths was recorded on the boring logs (Appendix B).

2.3 Laboratory Testing

Laboratory tests were performed on representative bulk and relatively undisturbed samples to provide a basis for development of design parameters. Selected samples were tested for insitu moisture and density, plasticity index, compaction characteristics (maximum dry density and optimum moisture), direct shear strength, expansion index, consolidation characteristics, and geotechnical characteristics (soluble sulfate, chloride, minimum resistivity, pH). The results of our laboratory testing, along with brief summaries of the testing procedures, are presented in Appendix C. The results of the in-situ moisture and density determinations are presented on the boring logs (Appendix B).

3.0 SUMMARY OF GEOTECHNICAL FINDINGS

3.1 Regional Geologic Setting

The subject site is located within a prominent natural geomorphic province in southwestern California known as the Peninsular Ranges. The Peninsular Ranges are characterized by steep, elongated ranges and valleys that generally trend northwestward. Tectonic activity along the numerous faults in the region has created the geomorphology present today.

The subject site is located along the southwestern edge of the relatively stable Perris Block, an eroded mass of Cretaceous and older crystalline and metamorphic rock. Thin sedimentary, metamorphic and volcanic units locally mantle the bedrock with alluvial deposits filling in the lower valley and drainage areas. The Perris Block is bounded by the San Jacinto fault zone to the northeast, the Elsinore fault zone to the southwest, the Cucamonga fault zone to the northwest and to the southeast by the Temecula basin which is poorly defined. The region has a complex history, apparently undergoing relative vertical movements of several thousand feet in response to movement on the Elsinore and San Jacinto fault zones.

3.2 Site Geologic Units

Our field exploration, observations, and review of the pertinent literature (Appendix A) indicate that subsurface materials within the site include several geologic units consisting of various granitic units and alluvial deposits. All of these materials are suitable for re-use as compacted fill, if cleared of debris and organic matter. A general description of each unit follows.

3.2.1 Artificial Fill (not a mapped unit)

Artificial fill was encountered locally throughout the western portion of the site. The fills were related to existing roadways, residences, and other existing structures. All existing fill is undocumented and is not considered suitable for the support of additional fills or structural improvements. All artificial fill soils should be removed and recompacted in accordance with the recommendations in Section 5.2 of this report.

3.2.2 Alluvial Deposits (Map Symbol - Qal)

Existing alluvial soil overlays the majority of the site. As encountered, the alluvial soils generally consist of brown to red- or gray-brown, loose to medium dense, fine to coarse sand to silty sand.

The alluvium was encountered in the borings to depths ranging from about 2.5 feet to approximately 15 feet below grade. The alluvium was similarly encountered in the test pits to depths varying from approximately 3.5 to the total excavation depth (approximately 14 feet) in the vicinity of TP-4. Greater depths of alluvium should be anticipated locally between the boring locations.

The near-surface alluvium should be removed from all areas in accordance with Section 5.2 of this report. Removal depths will vary depending upon location, but are anticipated to reach 4 to 10 feet below the existing ground surface in most areas. Some localized deeper removals may be required.

3.2.3 Cretaceous-Aged Undifferentiated Granitics (Map Symbol - Kgr)

The subject site is underlain by Cretaceous-aged granodiorite, tonalite, and gabbro bedrock. In the higher relief regions of the site, the granitic rock is exposed at the ground surface in some locations. The bedrock is typically light to medium gray, weathering to light brown and is generally medium to coarse-grained. Where exposed, the granitic bedrock is generally massive and can be expected to range from readily rippable to unrippable depending on the degree of weathering. Although the granitic rock is anticipated to generate gravel, cobbles and oversize boulders, the weathered bedrock is generally anticipated to be suitable for re-use as compacted fill.

The surface of the site contains numerous granitic boulders. It should be anticipated that site grading will generate a significant number of buried boulders, or floaters. Special placement of oversized material (greater than 12 inches) will be required as described in Section 5.6 of this report.

3.3 Surface Water and Groundwater

A small amount of perched groundwater was encountered in test pit TP-4 at a depth of approximately 12 feet below grade. TP-4 is located in the vicinity of the northwest-trending drainage channel in the central portion of the site. Groundwater was not encountered in any of the borings and no standing water was observed on the ground surface during the time of the investigation.

Based on our observations, we anticipate that limited perched groundwater may be encountered locally during grading of the subject site. We do not anticipate that the water will create a significant constraint to grading operations. However, it should be noted that local perched water conditions may occur in the future, and may fluctuate seasonally, depending on rainfall and irrigation conditions. After grading, seepage may be encountered in the cut slopes along the northeast boundary of the site. These conditions should be addressed on a case-by-case basis, if encountered.

3.4 Landslides and Rockfalls

No evidence of on-site landslides was observed during our field investigation. However, the steep, south and west-sloping hillsides on the eastern portion of the site contain numerous loose boulders. The potential for rockfall due to either erosion or seismic ground shaking is significant in this area.

The potential hazard from individual rocks should be assessed during grading. Where possible, rockfall hazards should be removed during grading. In the event that potentially unstable rock cannot be removed, remedial measures such as catchment areas, rock fences, or setbacks may be required. Recommendations should be provided by the geotechnical consultant, based on the actual conditions encountered.

3.5 Rippability

Based on the results of our field investigations, we anticipate that the bedrock in most areas of the subject site will generally be rippable to the proposed design grades with conventional heavy earth moving equipment in good operating conditions (Caterpillar D9L or D10 with single shank ripper and rock teeth). Localized marginally rippable to unrippable rock may be encountered in the proposed cut slopes in the western and southern portions of the site, as well as in the knolls along the southern site boundary. Special excavation techniques may be required for grading and utility installation in these areas.

For proposed building pads and utility trenches in marginally rippable to non-rippable rock areas, it may be desirable to overexcavate at least 2 feet below the bottom of proposed utility trenches or 3 to 5 feet below pad grade to facilitate future trenching operations. In addition, due to differential weathering of the granitic bedrock materials, very heavy ripping and/or other specialized excavation techniques may be required to maintain desired excavation rates in some areas.

3.6 Faulting

No active or inactive fault traces are known to traverse the site (Morton, 2003) and no evidence of onsite faulting was observed during our investigation. As defined by the California Geologic Survey, an active fault is one that has had surface displacement within the Holocene Epoch (roughly the last 11,000 years). The California Geologic Survey has defined a potentially active fault as any fault which has been active during the Quaternary Period (approximately the last 1,600,000 years).

These definitions are used in delineating Earthquake Fault Zones as mandated by the Alquist-Priolo Earthquake Fault Zoning Act. The intent of the act is to require fault investigations on sites located within Earthquake Fault Hazard Zones (Special Studies

Zones) to preclude new construction of certain inhabited structures across the trace of active faults.

The Temecula segment of the active Elsinore Fault Zone is located approximately 6.6 miles (10.6 km) south of the site (Blake, 2000b). The subject site is **not** included within an Earthquake Fault Zone as created by the Alquist-Priolo Earthquake Fault Zoning Act (Hart, 1999).

3.7 Seismicity

Our evaluation of the regional seismicity included a deterministic analysis using EQSEARCH and EQFAULT (Blake, 2000a & 2000b) and probabilistic analysis using FRISKSP (Blake, 2000c). As indicated above, the nearest known active fault and source of the design earthquake is considered to be the Elsinore Fault Zone, which is located approximately 6.6 miles south of the subject site. The maximum moment magnitude earthquake is currently estimated to be moment magnitude 6.8Mw (Blake, 2000a).

The Uniform Building Code (UBC) established Seismic Zones (often accepted as minimum standards) based on maps showing ground motion with a 475-year return period, or a 10% probability of exceedance in 50 years. The California Geologic Survey (CGS) Probabilistic Seismic Hazard Model (CGS, 2003) indicates a 10% probability that a peak ground acceleration of up to 0.45g would be exceeded at the subject site in 50 years. This is consistent with Leighton's probabilistic analysis, which was performed with FRISKSP (Blake, 2000c). The design earthquake is therefore considered to be a moment magnitude 6.8Mw event on the Elsinore Fault Zone that would generate a probabilistic peak ground acceleration of 0.45g (Blake, 2000c).

The effect of seismic shaking may be reduced by adhering to the 1997 UBC and seismic design parameters suggested by the Structural Engineers Association of California. The site is located within Seismic Zone 4. Seismic design parameters are presented below:

Seismic Zone	=	4
Seismic Source Type	=	B
Near Source Factor, N_a	=	1.0
Near Source Factor, N_v	=	1.0
Soil Profile Type	=	S_c
Horizontal Peak Ground Acceleration (10% probability of exceedance in 50 years)	=	0.45g

3.8 Secondary Seismic Effects

Secondary effects that can be associated with severe ground shaking following a relatively large earthquake include ground lurching, shallow ground rupture, liquefaction,

dynamic settlement, and flooding. These secondary effects of seismic shaking are discussed in the following sections.

3.8.1 Lurching and Shallow Ground Rupture

Soil lurching refers to the rolling motion on the ground surface by the passage of seismic surface waves. Effects of this nature are likely to be most severe where the thickness of soft sediments varies appreciably under structures. The potential for lurching can be reduced if the potentially compressible soils present on the site are removed and properly compacted in accordance with the recommendations of this report.

Ground rupture is generally considered to most likely occur along pre-existing active faults. No fault traces are known to traverse the site (Hart, 1999) and no evidence of onsite faulting was observed during our investigation. The potential for site ground rupture is considered low.

3.8.2 Liquefaction and Dynamic Settlement

Liquefaction and dynamic settlement of soils can be caused by strong vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils below a near-surface groundwater table are most susceptible to liquefaction, while the stability of most clayey material is not adversely affected by vibratory motion. Liquefaction is characterized by a loss of shear strength in the affected soil layers, thereby causing the soil to act as a viscous liquid. This effect may be manifested at the ground surface by settlement and, possibly, sand boils where insufficient confining overburden is present over liquefied layers. In order for the potential effects of liquefaction to be manifested at the ground surface, the soils generally have to be granular, loose to medium dense, saturated relatively near the ground surface and must be subjected to a sufficient magnitude and duration of ground shaking.

The subject site contains deposits of granular soils; however, these materials are relatively dense and generally unsaturated. Assuming that the loose, near-surface soils will be removed and recompacted in accordance with the recommendations of Section 5.0 of this report, it is our opinion the potential for liquefaction due to the design earthquake event to affect structures at this site is low.

Although the potential for liquefaction is low, ground accelerations generated from a seismic event can produce settlements in sands or granular earth materials both above and below the water table. The potential total seismic densification of the onsite dry to damp alluvial soils due to the design earthquake event may be on

the order of ½ inch. The potential differential seismic densification may be on the order of ½ inch in 40 feet laterally.

3.8.3 Flooding

Due to its inland location and distance from the nearest major body of water (Diamond Valley Reservoir, approximately 6 miles east of the site), we do not anticipate that the site will be at risk for seismically-induced flooding.

4.0 CONCLUSIONS

Based on our preliminary geotechnical evaluation, it is our professional opinion that the proposed development is feasible from a geotechnical standpoint. The following is a summary of the geotechnical factors that may affect development of the site.

- The existing onsite soils appear to be suitable for reuse as fill during proposed grading provided they are relatively free of organic material and debris.
- Undocumented fill soils (if encountered), topsoil, and the upper 4 to 10 feet of alluvium are considered to be potentially compressible and/or possess a hydrocollapse potential. These materials should be removed and recompacted. Deeper removals will be required locally.
- Based on our subsurface explorations, it is our opinion that the on-site earth materials in most areas can be excavated with heavy-duty conventional grading equipment in good working condition. Limited areas of unrippable rock should be anticipated along the hills bordering the site to the south and west.
- Site excavations will produce oversize rock (greater than 12 inches) which will require special handling and placement at depths of at least 10 feet below finish grade.
- Evidence of active faulting was not identified within or immediately adjacent to the subject site.
- Strong ground shaking and/or settlement (seismic densification) may occur at this site due to local earthquake activity.
- The design ground motion having a 10 percent probability of being exceeded in 50 years is expected to produce a peak horizontal ground surface acceleration at the site of up to approximately 0.45g.
- Numerous large boulders are exposed on the surface of the site, both in the proposed area of development, and on the hillside to the northeast of the proposed development. These boulders present a rockfall hazard. Individual boulders located above the proposed cut slopes should be evaluated during grading and removed if necessary.
- Groundwater was not encountered in the soil borings during our investigation. Shallow groundwater may be encountered locally during site grading and construction depending on rainfall. We do not anticipate that groundwater will be a significant constraint during grading.
- Perched water may develop in areas of soils with contrasting permeabilities, possibly resulting in saturated fills or seepage from slopes. This condition is often a result of individual homeowners' water use and irrigation practices.
- Based on preliminary laboratory results, onsite earth materials are expected to possess a very low to low expansion potential. Moderately expansive soils may be encountered locally

during rough grading. Additional testing should be performed during site grading to verify these observations and limited laboratory data.

- Limited laboratory testing (Appendix E) indicates that the on-site soils present a negligible sulfate exposure to concrete. Additional testing should be performed during site grading to verify these observations and limited laboratory data.
- Fill and cut slopes are proposed at up to approximately 15 and 38 feet in height, respectively. Because of remedial grading, the fill portion of the proposed fill-over-cut slopes may increase significantly. Fill and cut slopes up to approximately 30 feet and 45 feet in height, respectively, are expected to be grossly and surficially stable (see Appendix F), assuming that the recommendations of this report are implemented during grading. Cut slopes should be observed during grading for unfavorable conditions, which may require remediation.
- Unprotected pads and slope faces will be susceptible to erosion. This risk can be reduced by planting the slopes as soon as possible after grading, and by maintaining proper erosion control measures.

5.0 RECOMMENDATIONS.

5.1 General

Based on the results of the preliminary field and laboratory testing, it is our opinion that the subject site is suitable for residential development from a geotechnical viewpoint. Grading of the site should be in accordance with our recommendations and the General Earthwork and Grading Specifications in Appendix F and recommendations of future evaluations based on site specific development plans.

5.2 Site Preparation and Remedial Removals

Prior to grading, the proposed structural improvement areas (i.e. all structural fill areas, pavement areas, buildings, etc.) of the site should be cleared of surface and subsurface obstructions, heavy vegetation and boulders. Roots and debris should be disposed of offsite. Septic Tanks or seepage pits, if encountered, should be abandoned in accordance with the County of Riverside Department of Health Services guidelines.

The near surface native and undocumented fill soils that exist on site are potentially compressible in their present state and may settle under the surcharge of fills or foundation loading. In areas that will support additional fill soils or structural improvements, these soils should be removed down to competent material.

Competent material is considered to be dense granitic bedrock or undisturbed alluvium with an in-situ dry density of at least 110 pounds per cubic foot and a minimum of 85 percent relative compaction (based on ASTM D1557). Acceptability of all removal bottoms should be reviewed by an engineering geologist with field or laboratory testing under the supervision of a geotechnical engineer. The removal bottom elevations, methodology of testing alluvium and test results of left-in-place alluvium should be documented in the as-graded geotechnical report.

The removal limit should be established by a 1:1 projection from the edge of fill soils supporting settlement-sensitive structures downward and outward to competent material identified by the geotechnical consultant. The remedial removal depths will vary with location and with the proposed site configuration. The removal depths are generally expected to range from approximately 4 to 10 feet below existing grade, and locally deeper. Removals will also include benching into competent material as the fills rise. Areas adjacent to existing structures, including roadways, may require special monitoring. Temporary slopes in these areas should be no steeper than ¾:1 (horizontal:vertical). Friable materials, if encountered, may require additional layback.

5.3 Cut/Fill Transition Lots

In order to mitigate the impact of underlying cut/fill transition conditions, we recommend overexcavation of the cut portion of transition lots. Overexcavation should extend to a minimum depth of 3 feet below the bottom of the proposed footings or one-half of the maximum fill thickness on the lot, whichever is deeper. A maximum overexcavation depth of 10 feet is recommended. This overexcavation does not include scarification or preprocessing prior to placement of fill. Overexcavation can encompass the entire lot or extend laterally beyond the building limits a horizontal distance equal to the depth of overexcavation or to a minimum distance of 5 feet, whichever is greater. Overexcavation bottoms should be sloped as needed to prevent the accumulation of subsurface water.

5.4 Cut Lots and Streets

In order to facilitate excavation of footings and trenches in granitic rock, we recommend that cut lots be overexcavated to a minimum depth of 3 feet below finish grades and then capped with compacted fill. Consideration should be given for additional overexcavation of the pad to facilitate onsite utility construction. We further recommend streets be overexcavated to a minimum depth of 2 feet below the deepest utility and then brought back up to design grades with compacted fill.

5.5 Structural Fills

The onsite soils are generally suitable for re-use as compacted fill, provided they are free of debris and organic matter. Fills placed within 10 feet of finish pad grades or slope faces should contain no rocks over 12 inches in maximum dimension.

Areas to receive structural fill and/or other surface improvements should be scarified to a minimum depth of 8 inches, conditioned to at least optimum moisture content, and recompacted. Fill soils should be placed at a minimum of 90 percent relative compaction (based on ASTM D1557) and near or above optimum moisture content. Placement and compaction of fill should be performed in accordance with local grading ordinances under the observation and testing of the geotechnical consultant. The optimum lift thickness to produce a uniformly compacted fill will depend on the type and size of compaction equipment used. In general, fill should be placed in uniform lifts not exceeding 8 inches in thickness.

Fill slope keyways will be necessary at the toe of all fill slopes and at fill-over-cut contacts. Keyway schematics, including dimensions and subdrain recommendations, are provided in Appendix F of this report. All keyways should be excavated into dense bedrock or dense alluvium as determined by the geotechnical engineer. The cut portions

of all slope and keyway excavations should be geologically mapped and approved by a geologist prior to fill placement.

Fills placed on slopes steeper than 5:1 (horizontal:vertical) should be benched into dense soils (see Appendix F for benching detail). Benching should be of sufficient depth to remove all loose material. A minimum bench height of 2 feet into approved material should be maintained at all times.

5.6 Oversized Rock

Based on our observations, we anticipate that grading of the subject site will produce a significant amount of oversized rock (greater than 12 inches in maximum dimension). No rock in excess of 12 inches in maximum dimension may be placed in any fill with 10 feet of finish grade. Oversized rock may be placed in the deeper fill portions of the site, if placed in accordance with the following guidelines and the specifications contained in Appendix F.

Within the upper 5 feet of finish grade, fill soils should not contain rock greater than 8 inches in maximum dimension in order to facilitate foundation and utility trench excavation. For fill soils between 5 and 10 feet below finish grade, the fill may contain rock up to 12 inches in maximum dimension and should be mixed with sufficient soil to eliminate voids. Below a depth of 10 feet, rocks up to a maximum dimension of 36 inches may be incorporated into the fill provided adequate fines to fill all voids are present. Rocks greater than 36 inches in diameter may be placed on a case-by-case basis. We anticipate that a minimum of approximately 35 to 40 percent coarse grained material will be necessary to adequately fill all voids. Soil used to fill voids in rock fills should be flooded during placement with a sufficient amount of water to wash soil into all voids. Material filling voids should be compacted to a minimum of 90 percent of the soil's maximum dry density. The outer 20 feet (10 feet vertically) of all fill slopes should not contain rocks greater than 12 inches. Subdrains should be provided at the base of all rock fills to minimize the potential for a build-up of hydrostatic pressure.

5.7 Shrinkage

The volume change of excavated onsite materials upon recompaction is expected to vary with materials, density, insitu moisture content, location, and compaction effort. The in-place and compacted densities of soil materials vary and accurate overall determination of shrinkage and bulking cannot be made. Therefore, we recommend site grading include, if possible, a balance area or ability to adjust import quantities to accommodate some variation. Based on our experience with similar materials, we anticipate 8 to 12 percent shrinkage in the on-site soils. For planning purposes, we recommend an estimate of 10 percent shrinkage. Due to the generally loose nature of the near surface soils covering most the site, a subsidence value of 0.25 feet should also be applied.

5.8 Import Soils

If import soils are necessary to bring the site up to the proposed grades, these soils should be granular in nature, relatively free of organic material, have an expansion index less than 50 (per ASTM Test Method D4829) and have a low corrosion impact to the proposed improvements. Import soils and/or the borrow site should be evaluated by the geotechnical consultant prior to being imported to the site.

5.9 Utility Trenches

The onsite soils are generally considered to be suitable as trench backfill provided they are screened of rocks over 6 inches in diameter (or local utility requirements) and organic matter. Trench backfill should be compacted in uniform lifts (not exceeding 8 inches in compacted thickness) by mechanical means to at least 90 percent relative compaction (ASTM Test Method D1557).

Excavation of utility trenches should be performed in accordance with the project plans, specifications and all applicable OSHA requirements. The contractor should be responsible for providing the "competent person" required by OSHA standards. Contractors should be advised that sandy or gravelly soils (such as fills generated from the onsite alluvium) can make excavations particularly unsafe if all safety precautions are not taken. In addition, excavations at or near the toe of slopes and/or parallel to slopes may be highly unstable due to the increased driving force and load on the trench wall. Excavation spoil piles and construction equipment should be kept away from the sides of the trenches.

Due to the nature of the on-site alluvial soils, utility trenches that extend into existing native materials may be unstable, particularly if friable soil or gravel layers are exposed. Utility trenches over 5 feet in depth may require shoring/shielding or layback at 1:1 (horizontal:vertical) or flatter, even after remedial grading has been performed.

5.10 Preliminary Foundation Design Parameters

Foundations and slabs should be preliminarily designed in accordance with structural considerations, the seismic parameters of Section 3.7 and the recommendations presented in the 1997 Uniform Building Code (ICBO, 1997). In addition, either post-tension or other stiffened foundation/slab systems may be considered on this site due to the relatively high potential for seismic activity and associated deformation. These foundation systems, combined with the recommended remedial grading, will reduce the potential impact caused by the design level earthquake.

We recommend that as grading progresses, each building pad be evaluated for its expansion potential and differential fill thickness. The final footing and slab design for each proposed structure should be designed based on the results of that evaluation.

Foundations and overlying structures should be designed to tolerate the static and dynamic settlement provided in Section 5.11 of this report. Dynamic settlements (Section 5.11) and peak horizontal ground acceleration (Section 3.7) should be evaluated by the structural engineer for significant effects to the structure.

For budgetary and preliminary planning purposes, foundation design parameters are provided in Table 1 for very low expansive soils (expansion index equal to or less than 20 as classified in accordance with Table 18-I-B of the 1997 UBC). Preliminary foundation design parameters for conventionally reinforced shallow foundations (in accordance with Section 1815 of the UBC) for low to medium expansive soils (expansion index greater than 20) on site are provided in Table 2. Alternatively, low and medium expansive soil subgrades, may utilize a post-tensioned foundation such that Table 3 and the 1997 UBC are followed by design.

5.11 Settlement Considerations

Based on the findings of this limited exploration and analysis, we recommend that the planned residential buildings be designed in anticipation of approximately ¾ inch of total static settlement with ½ inch of static differential settlement across a lateral distance of 40 feet. The majority of the static settlement associated with the building loads (elastic compression) is anticipated to occur during construction as the load is applied. Additionally, for rough grade design, the architect and structural engineer should utilize ¼ inch in 40 feet as a potential differential settlement effect due to seismic densification. When available, the rough grading plans should be reviewed by the geotechnical engineer with regard to anticipated settlement.

5.12 Footing Setback

We recommend a minimum horizontal setback distance from the face of slopes for all structural footings (retaining and decorative walls, building footings, etc.). This distance is measured from the outside bottom edge of the footing horizontally to the slope face (or to the face of a retaining wall) and should be a minimum of H/2, where H is the slope height (in feet). The setback should not be less than 7 feet and need not be greater than 10 feet.

Please note that the soils within the structural setback area possess poor lateral stability and improvements (such as retaining walls, pools, decks, sidewalks, fences, pavements, etc.) constructed within this setback area may be subject to lateral movement and/or differential settlement. Potential distress to such improvements may be mitigated by

providing a deepened footing or a pier and grade-beam foundation system to support the improvement. The deepened footing should meet the setback as described above.

5.13 Slope Stability

Based on the provided rough grading plans (Hunsaker & Associates, Inc., 2003), we anticipate that fill slopes will be less than 30 feet in height and constructed at a 2:1 (horizontal:vertical) inclination. A slope stability analysis has been performed on the estimated maximum fill slopes and is presented in Appendix E. Appropriate laboratory testing was performed to estimate future fill soil strength parameters and is presented in Appendix C. Based on our analysis, 2:1 fill slopes up to 30 feet in height are anticipated to be grossly stable for static and pseudostatic cases from a geotechnical standpoint. Review of the rough-grading plans for surficial and general slope stability should be performed when these plans are available.

Based on the provided rough grading plans (Hunsaker & Associates, Inc., 2003), we anticipate that cut slopes will be less than 45 feet in height and constructed at a 2:1 (horizontal:vertical) inclination. Based on our analysis (Appendix E), 2:1 cut slopes up to 45 feet in height in intact granitic are anticipated to be grossly stable for static and pseudostatic cases from a geotechnical standpoint. Cut slopes should be observed by an engineering geologist during grading. If unfavorable jointing, fracture patterns or seepage conditions are encountered, remedial measures may be required.

Slope faces are inherently subject to erosion, particularly if exposed to rainfall and irrigation. Landscaping and slope maintenance should be conducted as soon as possible in order to increase long-term surficial stability.

5.14 Retaining Walls

Due to risk of strong ground shaking, the design of any proposed retaining walls in excess of 5 feet in height should be reviewed by Leighton prior to construction. If walls in excess of 5 feet are planned, wall designs that tolerate the anticipated static and dynamic vertical deformations and incremental dynamic lateral earth pressures should be evaluated.

5.15 Site Drainage and Erosion

All drainage should be directed away from structures by means of approved permanent or temporary drainage devices. Adequate storm drainage should be provided to avoid siltation of any temporary catch basins. Linear sandbagging of the pads tangential to flow directions in periodic intervals, should reduce erosion potential of runoff over these pads.

In general, ponding of water should be avoided adjacent to the structures or pavements. For preliminary planning purposes, positive drainage may be accomplished by providing a minimum 2 percent gradient away from the structures for a distance of at least 5 feet. Protective measures to mitigate excessive site erosion and runoff during construction should also be implemented in accordance with the latest County of Riverside grading ordinances.

5.16 Geochemical Characteristics

Limited laboratory testing indicated a negligible concentration of soluble sulfates in onsite soils for representative samples. The laboratory test results are presented in Appendix E.

Additional corrosion testing should be performed on representative finish grade soils at the completion of rough grading. Concrete foundations in contact with site soils should be designed in accordance with Table 19-A-4 of the Uniform Building Code. A qualified corrosion engineer should be consulted to review the results of laboratory tests and coordinate additional testing if corrosion sensitive materials are to be used.

5.17 Preliminary Pavement Design Parameters

In order to provide the following preliminary recommendations, we have assumed an R-value of 30 for preliminary design purposes. These recommendations are intended for planning purposes only. For the final pavement design, appropriate traffic indices should be selected by the project civil engineer or traffic engineering consultant and representative samples of actual subgrade materials should be tested for R-value.

AC Pavement Section Thickness		
TI	Asphaltic-Concrete (AC) Thickness (inches)	Class 2 Aggregate Base (AB) Thickness (inches)
5	3.0	6.0
6	3.5	8.0
8	5.0	11.0
10	6.0	15.0

The subgrade soils in the upper 6 inches should be properly compacted to at least 95 percent relative compaction (ASTM D1557) and should be moisture-conditioned to near optimum and kept in this condition until the pavement section is constructed. Proof-rolling subgrade to identify localized areas of yielding subgrade (if any) should be

performed prior to placement of aggregate base and under the observation of the geotechnical consultant.

Minimum relative compaction requirements for aggregate base should be 95 percent of the maximum laboratory density as determined by ASTM D1557. Base rock should conform to the "Standard Specifications for Public Works Construction" (green book) current edition or Caltrans Class 2 aggregate base having a minimum R-value of 78. Asphaltic concrete should be placed on compacted aggregate base and compacted to a minimum 95 percent relative compaction based on the laboratory standards ASTM D1561 and D2726.

The preliminary pavement sections provided in this section are meant as minimum, if thinner or highly variable pavement sections are constructed, increased maintenance and repair may be needed.

6.0 GEOTECHNICAL REVIEW

Geotechnical review is of paramount importance in engineering practice. The poor performance of many foundation and earthwork projects have been attributed to inadequate construction review. We recommend that Leighton and Associates be provided the opportunity to review the following items.

6.1 Plans and Specifications

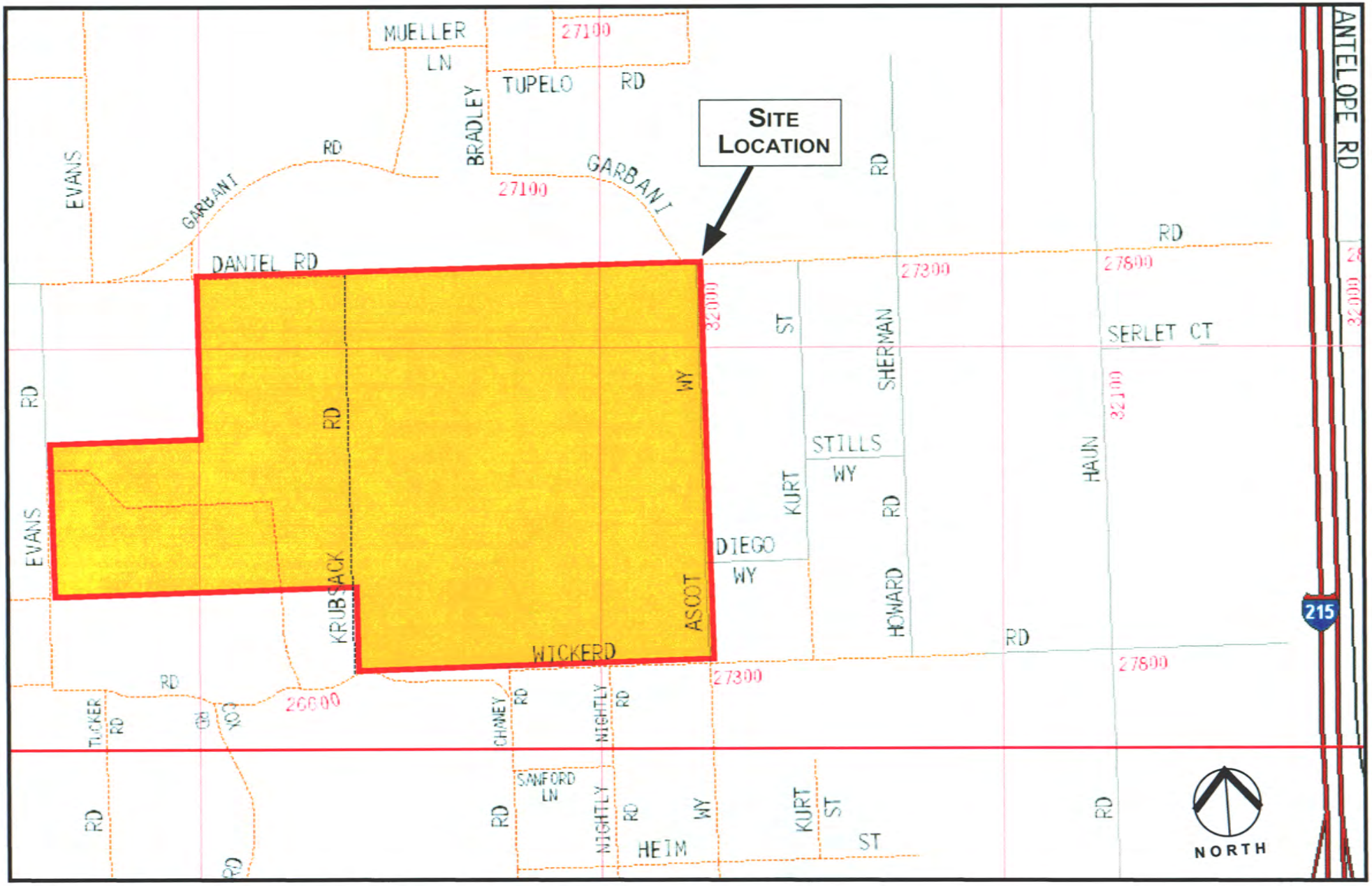
Leighton and Associates should review the precise grading and foundation plans and project specifications when they are completed. Such review is necessary to evaluate whether the geotechnical recommendations have been effectively incorporated in plans and other construction documents. Review findings should be reported in writing.

6.2 Construction Review

Observation and testing should be performed by Leighton and Associates representatives during grading and construction. It should be anticipated that the substrata exposed during construction may vary from those encountered in the borings. Reasonably continuous construction observation and review during site grading and foundation installation allows for evaluation of the actual soil conditions and the ability to provide appropriate revisions during construction, if required.

Site preparation, removal of unsuitable soils, approval of imported earth materials, fill placement, foundation installation and other site geotechnically-related operations should be observed and tested by representatives of Leighton and Associates.

Additional laboratory tests of subsurface materials should be performed during or prior to grading to confirm compacted density and moisture content, corrosion potential and expansion potential.



Base Map: The Thomas Guide San Bernardino And Riverside Edition, 2004, Not To Scale

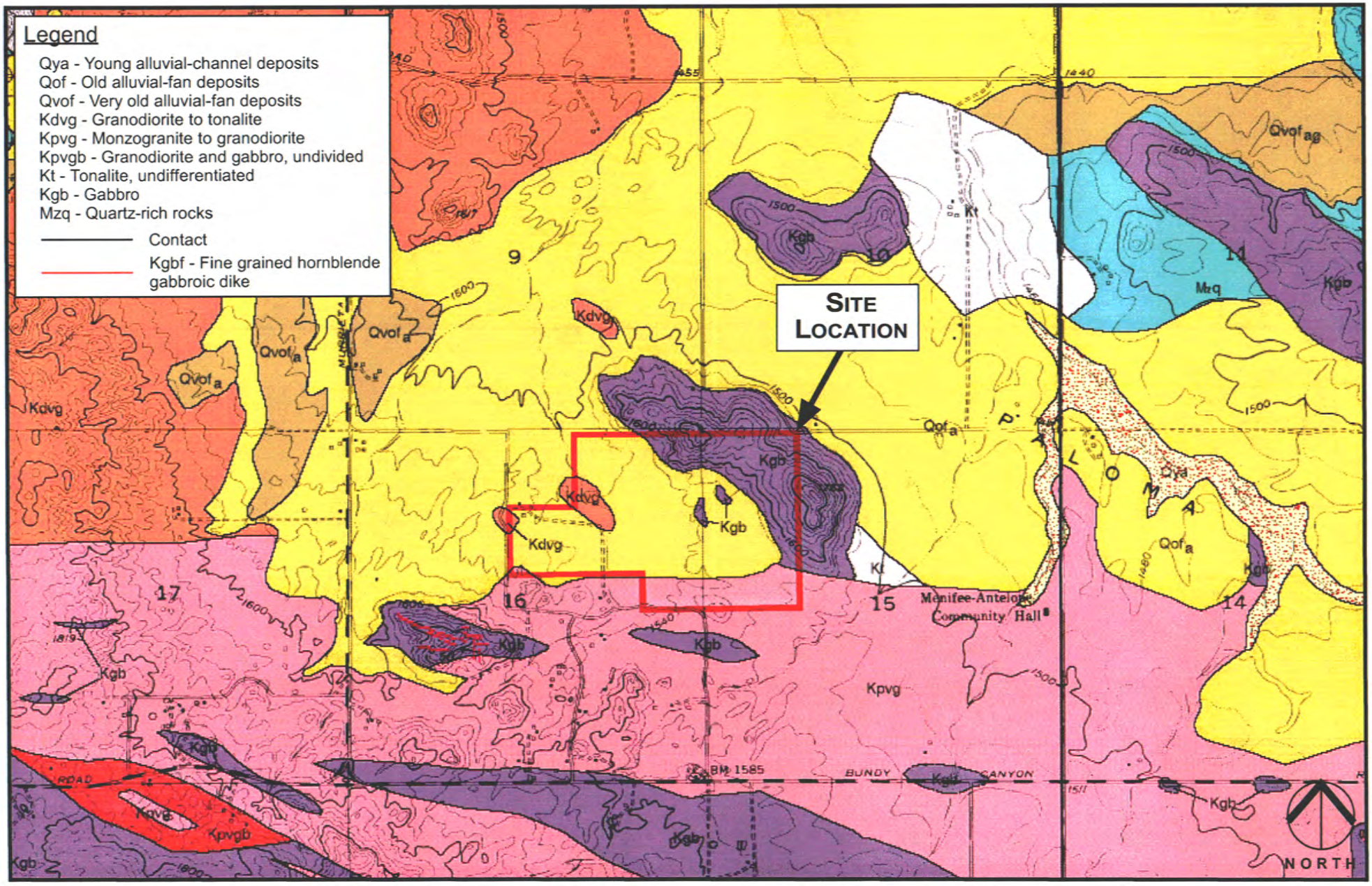
Geotechnical Review
Tract 31194 Woodside Homes
Evans & Garbani Road, Menifee
Riverside County, California

SITE LOCATION MAP

Project No.
110712-002

Date
January 2004

Figure No. 1



Base Map: Geologic Map of the Romoland 7.5 Minute Quadrangle, Riverside, California, Open File Report 03-102, Not To Scale

Geotechnical Review
Tract 31194 Woodside Homes
Evans & Garbani Road, Menifee
Riverside County, California

REGIONAL GEOLOGIC MAP

Project No.
110712-002

Date
January 2004

Figure No. 2

TABLE 1

Minimum Foundation Design Recommendations for Very Low Expansive Soils

	U.B.C. Expansion Index 0-20 Very Low Expansion
1-Story Footings (See Note 1)	All footings 12" deep. Reinforcement for continuous footings: one No. 4 bar top and bottom.
2-Story Footings (See Note 1)	All footings 18" deep. Reinforcement for continuous footings: one No. 4 bar top and bottom.
Minimum Footing Width	Continuous: 12" for 1-story Continuous: 15" for 2-story Isolated column: 24" (18" deep minimum)
Garage Door Grade Beam (See Note 3)	A grade beam 12" wide x 12" deep (18" deep for 2-story) should be provided across the garage entrance.
Living Area Floor Slabs (See Notes 4, 5 and 6)	Minimum 4" thick slab. No. 3 bars at 18 inches on center each way (at midheight).
Garage Floor Slabs (See Notes 5, 6 and 7)	Minimum 4" thick slab. No. 3 bars at 18 inches on center each way (at midheight). Slab should be quarter-sawn.
Presoaking	Optimum moisture to a depth of 6 inches.
Allowable Bearing Capacity	2,000 pounds per square foot (one-third increase for short term loading)

Table 1 Notes:

(1) Depth of interior or exterior footing to be measured from lowest adjacent finish grade or drainage swale flowline elevation if less than 5 feet laterally from the building foundation.

(2) Exterior column footings should be structurally tied in two directions using grade beams and founded at least 18 inches below the lowest adjacent soil grade.

(3) The base of the grade beam should be at the same elevation as that of the adjoining footings.

(4) Living area slabs should be tied to the footings as directed by the structural engineer.

(5) A 10-mil vapor inhibitor, clean crushed rock or fine-graded material should be placed beneath slabs in accordance with ASTM E1643 and ACI guidelines. All laps and penetrations in the vapor inhibitor should be sealed.

(6) Garage slabs should be isolated from stem wall footings with a minimum 3/8" felt expansion joint.

(7) The recommendations presented above assume that proper maintenance irrigation and drainage are maintained around the structure.

TABLE 2

Minimum Foundation Design Recommendations for Low and Medium Expansive Soils

	UBC Expansion Index Low (21-50)	UBC Expansion Index Medium (51-90)
1-Story Footing, Depth of Embedment	12"	18"
2-Story Footing, Depth of Embedment	18"	24"
1- or 2-Story Isolated Exterior Column Footings	24" width (18" deep, minimum)	24" width (24" deep, minimum)
Presoaking	1.2 times the optimum moisture to a depth of 12 inches	1.3 times the optimum moisture to a depth of 18 inches
Plasticity Index	20	30
Allowable Bearing Capacity	2,000 pounds per square foot (one-third increase for short term loading)	2,000 pounds per square foot (one-third increase for short term loading)

Table 2 Notes:

(1) Concrete floor slabs designed in accordance with UBC Section 1815 should be of sufficient thickness to resist design expansive soil pressures and in accordance with the structural engineers recommendations and the UBC.

(2) Exterior column footings should be structurally tied in two directions using grade beams and founded at least 18 inches below the lowest adjacent soil grade.

(3) A 10 mil vapor inhibitor; clean crushed rock crusher-run or fine-graded material should be placed beneath slabs in accordance with ASTM E1643 and ACI guidelines. All laps and penetrations in the vapor inhibitor should be sealed.

(4) If the concrete slab/floor for the foundation are designed in accordance with Section 1815 of the UBC, a continuous perimeter footing will likely be used including the garage opening.

(5) Low to medium expansive soil slabs/foundations designed in accordance with UBC Section 1815 should be placed monolithically.

(6) Depth of exterior footing to be measured from lowest adjacent finish grade or drainage swale flowline elevation if less than 5 feet laterally from the adjacent exterior footing.

(7) Floor slab detailing including crack control joints (if necessary) per the structural engineer's recommendations.

TABLE 3

Minimum Post-Tensioned Foundation Design Recommendations For Low to Medium Expansive Soils

Design Criteria		Expansion Potential (UBC 18-2)	
		Low (0-50)	Medium (51-90)
Edge Moisture Variation, e_m	Center Lift:	5.5 feet	5.5 feet
	Edge Lift:	3.0 feet	3.0 feet
Differential Swell, y_m	Center Lift:	2.0 inches	2.4 inches
	Edge Lift:	0.4 inches	0.8 inches
Modulus of Subgrade Reaction (k)		150 psi/in	125 psi/in
Minimum Perimeter Footing Embedment Depth 1-Story 2-Story		 12 inches 18 inches	 18 inches 24 inches
Presoaking		1.2 times the optimum moisture to a depth of 12 inches	1.3 times the optimum moisture to a depth of 18 inches
Allowable Bearing Capacity:		2,000 psf (one-third increase for short term loading)	

Table 3 Notes:

(1) Concrete floor slabs designed in accordance with UBC Section 1816 should be of sufficient thickness to resist design expansive soil pressures and in accordance with the structural engineers recommendations and the UBC.

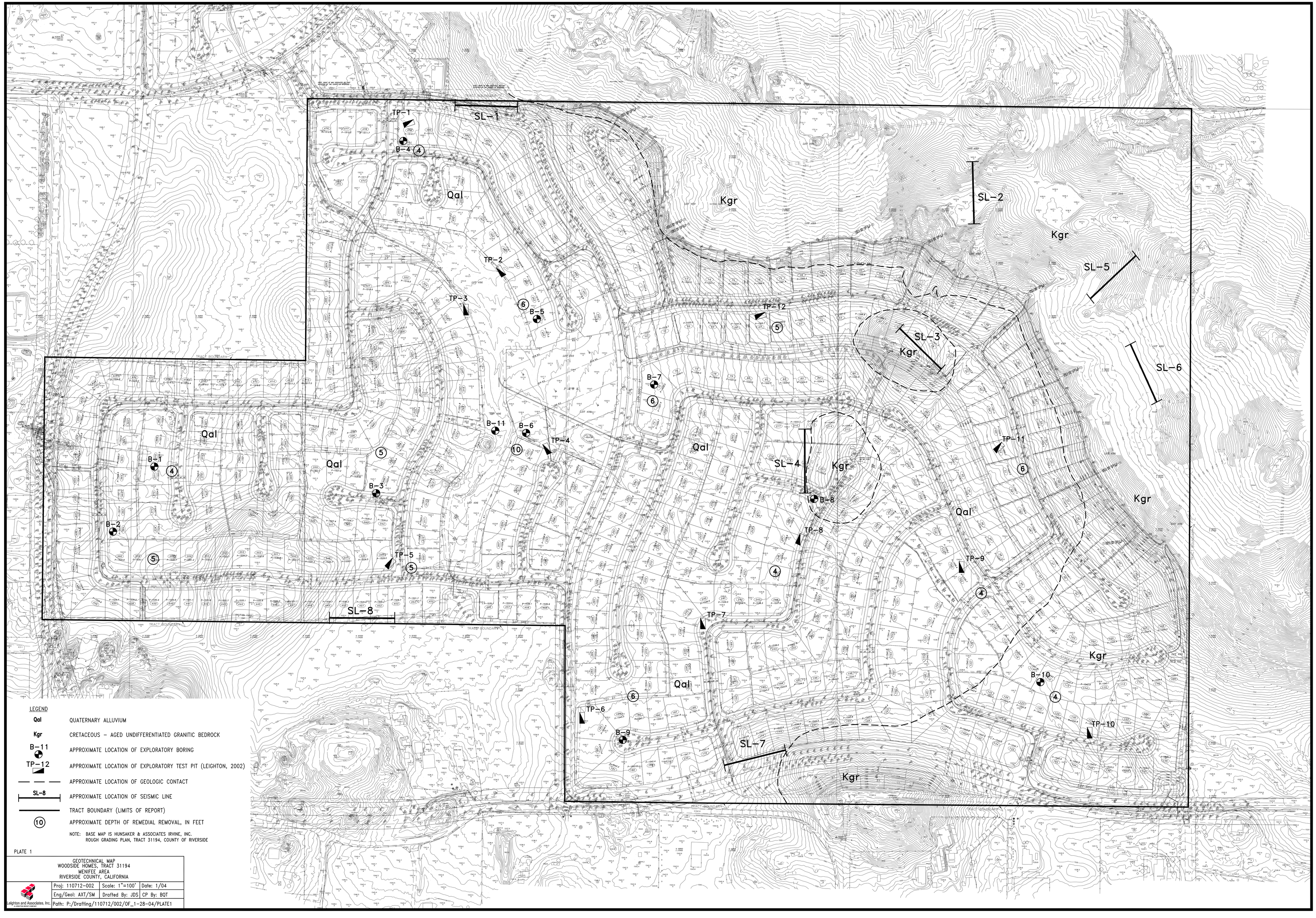
(2) A 10 mil vapor inhibitor, clean crushed rock or fine-graded material should be placed beneath slabs in accordance with ASTM E1643 and ACI guidelines. All laps and penetrations in the vapor inhibitor should be sealed.

(3) Depth of exterior footing to be measured from lowest adjacent finish grade or drainage swale flowline elevation if less than 5 feet laterally from the adjacent exterior footing.

(4) Exterior column footings should be structurally tied to the main foundation.

(5) Floor slab detailing including crack control joints (if necessary) per the structural engineer's recommendations.

(6) Potential total and differential settlement should be included cumulatively with differential swell parameters.



LEGEND

Qal	QUATERNARY ALLUVIUM
Kgr	CRETACEOUS – AGED UNDIFFERENTIATED GRANITIC BEDROCK
B-11	APPROXIMATE LOCATION OF EXPLORATORY BORING
TP-12	APPROXIMATE LOCATION OF EXPLORATORY TEST PIT (LEIGHTON, 2002)
	APPROXIMATE LOCATION OF GEOLOGIC CONTACT
SL-8	APPROXIMATE LOCATION OF SEISMIC LINE
	TRACT BOUNDARY (LIMITS OF REPORT)
10	APPROXIMATE DEPTH OF REMEDIAL REMOVAL, IN FEET

NOTE: BASE MAP IS HUNSAKER & ASSOCIATES IRVINE, INC.
ROUGH GRADING PLAN, TRACT 31194, COUNTY OF RIVERSIDE

PLATE 1

GEOTECHNICAL MAP
WOODSIDE HOMES, TRACT 31194
MENIFEE AREA
RIVERSIDE COUNTY, CALIFORNIA

Proj: 110712-002	Scale: 1"=100'	Date: 1/04
Eng/Geol: AXT/SM	Drafted By: JDS	CP By: BQT
Path: P:/Drafting/110712/002/OF_1-28-04/PLATE1		

Leighton and Associates, Inc.

Appendix A

APPENDIX A

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Appendix B

GEOTECHNICAL BORING LOG B-1

Date 1-12-04 **Sheet** 1 **of** 1

Project Woodside Evans & Garboni **Project No.** 110712-002

Drilling Co. Cal Pac **Type of Rig** B-61

Hole Diameter 8" **Drive Weight** 140 lbs **Drop** 30"

Elevation Top of Hole +/- 1514' **Location** See Map

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
	0		Bulk 1 @0-5'					SP	Logged By AVI Sampled By AVI ARTIFICIAL FILL UNDOCUMENTED (Afu) @ Surface: Brown, moist, loose, fine to coarse SAND with various debris	MD, DS
1510				2	23	121.3	10.1	SM	QUATERNARY ALLUVIUM (Qal) @ 2.5': Dark green, moist, medium dense, silty, fine SAND with few gravels @ 3.5': Brown, moist, medium dense, silty, medium SAND with trace clay	
	5		Bulk 4 @5-10'	3	59	125.3	5.4		CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 5': Yellow-green, moist, dense, highly weathered BEDROCK	MD, DS
1505				5	26	123.9	8.3		@ 7.5': Yellow-green, moist, medium dense, highly weathered BEDROCK	DS
	10			6	51	129.6	6.0		@ 10': Light brown to dark gray, moist, dense, highly weathered BEDROCK	
					50/5"				@ 12.5': Light green, moist, very dense, weathered BEDROCK	
1500	15								Refusal @ 13.5' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1495	20									
1490	25									
1485	30									

SAMPLE TYPES:

- S SPLIT SPOON
- R RING SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE
- G GRAB SAMPLE
- C CORE SAMPLE

TYPE OF TESTS:

- SU SULFATE
- DS DIRECT SHEAR
- MD MAXIMUM DENSITY
- CN CONSOLIDATION
- CR CORROSION
- HCO HYDROCOLLAPSE
- HD HYDROMETER
- SA SIEVE ANALYSIS
- AL ATTERBERG LIMITS
- EI EXPANSION INDEX
- RV R-VALUE
- CS CORROSION SUITE
- MC MOISTURE CONTENT
- SE SAND EQUIVALENT
- -200 200 WASH
- RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-2

Date 1-12-04 | Sheet 1 of 1

Project Woodside Evans & Garboni | Project No. 110712-002

Drilling Co. Cal Pac | Type of Rig B-61

Hole Diameter 8" | Drive Weight 140 lbs | Drop 30"

Elevation Top of Hole +/- 1518' | Location See Map

Logged By AVI

Sampled By AVI

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
	0							SP	QUATERNARY ALLUVIUM (Qal) @ Surface: Light brown, moist, fine to coarse SAND with few grass	
1515				1	25	98.6	9.6	SM	@ 2.5': Brown, moist, medium dense, silty, fine SAND with rootlets common	
	5			2	29	113.0	7.7		@ 5': Light brown to brown, moist, medium dense, silty, fine SAND	
1510				3	50/5"	112.6	2.5		CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 7.5': Gray-brown, moist, very dense, weathered BEDROCK	
	10								Refusal @ 8' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1505										
	15									
1500										
	20									
1495										
	25									
1490										
	30									

SAMPLE TYPES:

- S SPLIT SPOON
- R RING SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE
- G GRAB SAMPLE
- C CORE SAMPLE

TYPE OF TESTS:

- SU SULFATE
- DS DIRECT SHEAR
- MD MAXIMUM DENSITY
- CN CONSOLIDATION
- CR CORROSION
- HCO HYDROCOLLAPSE
- HD HYDROMETER
- SA SIEVE ANALYSIS
- AL ATTERBERG LIMITS
- EI EXPANSION INDEX
- RV R-VALUE
- CS CORROSION SUITE
- MC MOISTURE CONTENT
- SE SAND EQUIVALENT
- -200 200 WASH
- RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-3

Date 1-12-04 | Sheet 1 of 1
Project Woodside Evans & Garboni | Project No. 110712-002
Drilling Co. Cal Pac | Type of Rig B-61
Hole Diameter 8" | Drive Weight 140 lbs | Drop 30"
Elevation Top of Hole +/- 1523' | Location See Map

Logged By AVI
Sampled By AVI

Elevation Feet	Depth Feet	Graphic Log	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
	0	N S	Bulk 1 @0-5'					SP	QUATERNARY ALLUVIUM (Qal) @ Surface: Brown, damp, loose, silty SAND with abundant vegetation	
1520				2	35	108.4	11.1	SM	@ 2.5': Brown, damp, medium dense, silty, fine SAND with abundant rootlets	
	5			3	36				@ 5': Red-brown, damp, medium dense, silty, fine SAND with rootlets and porous	
1515				4	50/4"	123.9	5.9	SP	@ 7.5': Red-brown, moist, dense, fine to coarse SAND CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 8': Red-brown, moist, dense weathered BEDROCK	
	10								Total Depth 8.5' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1510										
	15									
1505										
	20									
1500										
	25									
1495										
	30									

SAMPLE TYPES:
S SPLIT SPOON
R RING SAMPLE
B BULK SAMPLE
T TUBE SAMPLE
G GRAB SAMPLE
C CORE SAMPLE

TYPE OF TESTS:
SU SULFATE
DS DIRECT SHEAR
MD MAXIMUM DENSITY
CN CONSOLIDATION
CR CORROSION
HCO HYDROCOLLAPSE
HD HYDROMETER
SA SIEVE ANALYSIS
AL ATTERBERG LIMITS
EI EXPANSION INDEX
RV R-VALUE
CS CORROSION SUITE
MC MOISTURE CONTENT
SE SAND EQUIVALENT
-200 200 WASH
RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-4

Date 1-12-04 **Sheet** 1 **of** 1

Project Woodside Evans & Garboni **Project No.** 110712-002

Drilling Co. Cal Pac **Type of Rig** B-61

Hole Diameter 8" **Drive Weight** 140 lbs **Drop** 30"

Elevation Top of Hole +/- 1507' **Location** See Map

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
									Logged By AVI **Sampled By** AVI	
1505	0		Bulk 1 @0-5'					SP	QUATERNARY ALLUVIUM (Qal) @ Surface: Light brown, damp, loose, fine to coarse SAND with sparse vegetation	
				2	44	125.8	5.8	SM	@ 2.5': Brown, moist, medium dense, silty, medium to coarse SAND	
	5			3	50/3"	121.8	5.8		CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 5': Light brown, moist, very dense, weathered BEDROCK	
1500									Total Depth 5.8' No Groundwater Encountered Backfilled with Spoils 1-12-04	
	10									
1495										
	15									
1490										
	20									
1485										
	25									
1480										
	30									

SAMPLE TYPES:

- S SPLIT SPOON
- R RING SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE
- G GRAB SAMPLE
- C CORE SAMPLE

TYPE OF TESTS:

- SU SULFATE
- DS DIRECT SHEAR
- MD MAXIMUM DENSITY
- CN CONSOLIDATION
- CR CORROSION
- HCO HYDROCOLLAPSE
- HD HYDROMETER
- SA SIEVE ANALYSIS
- AL ATTERBERG LIMITS
- EI EXPANSION INDEX
- RV R-VALUE
- CS CORROSION SUITE
- MC MOISTURE CONTENT
- SE SAND EQUIVALENT
- -200 200 WASH
- RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-5

Date 1-12-04 | Sheet 1 of 1

Project Woodside Evans & Garboni | Project No. 110712-002

Drilling Co. Cal Pac | Type of Rig B-61

Hole Diameter 8" | Drive Weight 140 lbs | Drop 30"

Elevation Top of Hole +/- 1515' | Location See Map

Logged By AVI

Sampled By AVI

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
1515	0							SP	QUATERNARY ALLUVIUM (Qal) @ Surface: Brown, damp, loose, fine to coarse SAND	
				1	14	102.8	6.0	SM	@ 2.5': Brown, damp, loose, silty, fine SAND with rootlets and porosity common	
1510	5			2	28	126.4	5.9		@ 5': Brown, damp, medium dense, silty, fine SAND with rootlets common and porous	HCO
				3	45	124.2	12.8		@ 7.5': Dark brown, moist, medium dense, silty, fine to medium SAND with few micas	HCO
1505	10			4	33	117.6	14.5		@ 10': Dark brown, very moist, medium dense, silty, fine SAND with few micas	
				5	16		14.2	SM/ML	@ 12.5': Brown-green, moist to very moist, silty SAND to sandy SILT with trace clay	
1500	15			6	50/4"	128.6	10.1		CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 15': Brown to dark gray, very moist, dense weathered BEDROCK	
1495	20				50/3"					
1490	25								Total Depth 20.3' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1485	30									

SAMPLE TYPES:

- S SPLIT SPOON
- R RING SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE
- G GRAB SAMPLE
- C CORE SAMPLE

TYPE OF TESTS:

- SU SULFATE
- DS DIRECT SHEAR
- MD MAXIMUM DENSITY
- CN CONSOLIDATION
- CR CORROSION
- HCO HYDROCOLLAPSE
- HD HYDROMETER
- SA SIEVE ANALYSIS
- AL ATTERBERG LIMITS
- EI EXPANSION INDEX
- RV R-VALUE
- CS CORROSION SUITE
- MC MOISTURE CONTENT
- SE SAND EQUIVALENT
- -200 200 WASH
- RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-6

Date 1-12-04 **Sheet** 1 **of** 1

Project Woodside Evans & Garboni **Project No.** 110712-002

Drilling Co. Cal Pac **Type of Rig** B-61

Hole Diameter 8" **Drive Weight** 140 lbs **Drop** 30"

Elevation Top of Hole +/- 1520' **Location** See Map

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
									Logged By AVI **Sampled By** AVI	
1520	0							SP	QUATERNARY ALLUVIUM (Qal) @ Surface: Brown, damp, loose, fine to coarse SAND with abundant vegetation	
				1	24	114.4	5.2	SM	@ 2.5': Light brown, moist, medium dense, silty, fine to medium SAND; slightly porous	
1515	5		Bulk 4 @5-10'	2	14	117.6	7.8	SP	@ 5': Light brown to dark gray, moist, loose, fine to coarse SAND	HCO AL, MD, EI
				3	27	129.3	6.7		@ 7.5': Red-brown, moist, medium dense, silty, fine to medium SAND with few gravels @ 9': Light gray-green, moist, medium dense, silty, fine SAND	
1510	10			5	50/6"	118.6	4.5		CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 10': Light gray-green, moist, dense, weathered BEDROCK	
									Total Depth 10.5' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1505	15									
1500	20									
1495	25									
1490	30									

SAMPLE TYPES:

- S SPLIT SPOON
- R RING SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE
- G GRAB SAMPLE
- C CORE SAMPLE

TYPE OF TESTS:

- SU SULFATE
- DS DIRECT SHEAR
- MD MAXIMUM DENSITY
- CN CONSOLIDATION
- CR CORROSION
- HCO HYDROCOLLAPSE
- HD HYDROMETER
- SA SIEVE ANALYSIS
- AL ATTERBERG LIMITS
- EI EXPANSION INDEX
- RV R-VALUE
- CS CORROSION SUITE
- MC MOISTURE CONTENT
- SE SAND EQUIVALENT
- -200 200 WASH
- RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-7

Date 1-12-04 | Sheet 1 of 1
Project Woodside Evans & Garboni | Project No. 110712-002
Drilling Co. Cal Pac | Type of Rig B-61
Hole Diameter 8" | Drive Weight 140 lbs | Drop 30"
Elevation Top of Hole +/- 1523' | Location See Map

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
									Logged By AVI Sampled By AVI	
	0							SP	QUATERNARY ALLUVIUM (Qal) @ Surface: Brown, damp, loose, fine to coarse SAND	
1520				1	23	114.6	5.0	SM	@ 2.5': Red-brown, damp, medium dense, silty, fine to medium SAND with rootlets and porosity common	
	5			2	25	107.8	7.3		@ 5': Red-brown, moist, medium dense, silty, fine to medium SAND with rootlets and porosity common, some mottling present	HCO
1515				3	50/3"	115.9	11.2		CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 7.5': Light gray-green, moist, very dense, weathered BEDROCK	
	10								Total Depth 10.3' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1510										
	15									
1505										
	20									
1500										
	25									
1495										
	30									

SAMPLE TYPES:
S SPLIT SPOON
R RING SAMPLE
B BULK SAMPLE
T TUBE SAMPLE
G GRAB SAMPLE
C CORE SAMPLE

TYPE OF TESTS:
SU SULFATE
DS DIRECT SHEAR
MD MAXIMUM DENSITY
CN CONSOLIDATION
CR CORROSION
HCO HYDROCOLLAPSE
HD HYDROMETER
SA SIEVE ANALYSIS
AL ATTERBERG LIMITS
EI EXPANSION INDEX
RV R-VALUE
CS CORROSION SUITE
MC MOISTURE CONTENT
SE SAND EQUIVALENT
-200 200 WASH
RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-8

Date 1-12-04 **Sheet** 1 of 1

Project Woodside Evans & Garboni **Project No.** 110712-002

Drilling Co. Cal Pac **Type of Rig** B-61

Hole Diameter 8" **Drive Weight** 140 lbs **Drop** 30"

Elevation Top of Hole +/- 1537' **Location** See Map

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION (Logged By AVI; Sampled By AVI)	Type of Tests
1535	0							SP	QUATERNARY ALLUVIUM (Qal) @ Surface: Red-brown, damp, loose, fine to coarse SAND	
				1	50/4"	109.3	8.7	SM	@ 2.5': Red-brown, damp, moist, very dense, silty SAND CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 3': Red-brown, moist, very dense weathered BEDROCK	
1530	5			2	50/4"				@ 5': Dark gray-orange, moist, very dense weathered BEDROCK	
	10								Total Depth 5.9' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1525										
	15									
1520										
	20									
1515										
	25									
1510										
	30									

SAMPLE TYPES:

- S SPLIT SPOON
- R RING SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE
- G GRAB SAMPLE
- C CORE SAMPLE

TYPE OF TESTS:

- SU SULFATE
- DS DIRECT SHEAR
- MD MAXIMUM DENSITY
- CN CONSOLIDATION
- CR CORROSION
- HCO HYDROCOLLAPSE
- HD HYDROMETER
- SA SIEVE ANALYSIS
- AL ATTERBERG LIMITS
- EI EXPANSION INDEX
- RV R-VALUE
- CS CORROSION SUITE
- MC MOISTURE CONTENT
- SE SAND EQUIVALENT
- -200 200 WASH
- RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-9

Date 1-12-04 **Sheet** 1 of 1

Project Woodside Evans & Garboni **Project No.** 110712-002

Drilling Co. Cal Pac **Type of Rig** B-61

Hole Diameter 8" **Drive Weight** 140 lbs **Drop** 30"

Elevation Top of Hole +/- 1536' **Location** See Map

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
									Logged By AVI **Sampled By** AVI	
1535	0							SP	QUATERNARY ALLUVIUM (Qal) @ Surface: Brown, damp, loose, fine to coarse SAND	
				1	23	121.3	2.9	SM	@ 2.5': Brown, damp to moist, medium dense, silty, medium to coarse SAND with few rootlets	
1530	5			2	21	111.9	5.9		@ 5': Brown, moist, medium dense, silty, fine SAND with rootlets common and porous	
				3	50/6"				CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ Light gray to green, moist, very dense weathered BEDROCK	
1525	10								Total Depth 8' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1520	15									
1515	20									
1510	25									
	30									

SAMPLE TYPES:

- S SPLIT SPOON
- R RING SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE
- G GRAB SAMPLE
- C CORE SAMPLE

TYPE OF TESTS:

- SU SULFATE
- DS DIRECT SHEAR
- MD MAXIMUM DENSITY
- CN CONSOLIDATION
- CR CORROSION
- HCO HYDROCOLLAPSE
- HD HYDROMETER
- SA SIEVE ANALYSIS
- AL ATTERBERG LIMITS
- EI EXPANSION INDEX
- RV R-VALUE
- CS CORROSION SUITE
- MC MOISTURE CONTENT
- SE SAND EQUIVALENT
- -200 200 WASH
- RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-10

Date 1-12-04 **Sheet** 1 **of** 1

Project Woodside Evans & Garboni **Project No.** 110712-002

Drilling Co. Cal Pac **Type of Rig** B-61

Hole Diameter 8" **Drive Weight** 140 lbs **Drop** 30"

Elevation Top of Hole +/- 1540' **Location** See Map

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
1540	0							SP	Logged By AVI Sampled By AVI QUATERNARY ALLUVIUM (Qal) @ Surface: Red-brown, damp, loose, fine to coarse SAND	
				1	50/5"				CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 2.5': Light brown to light gray, moist, very dense weathered BEDROCK	
1535	5								Total Depth 3' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1530	10									
1525	15									
1520	20									
1515	25									
1510	30									

SAMPLE TYPES:

- S SPLIT SPOON
- R RING SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE
- G GRAB SAMPLE
- C CORE SAMPLE

TYPE OF TESTS:

- SU SULFATE
- DS DIRECT SHEAR
- MD MAXIMUM DENSITY
- CN CONSOLIDATION
- CR CORROSION
- HCO HYDROCOLLAPSE
- HD HYDROMETER
- SA SIEVE ANALYSIS
- AL ATTERBERG LIMITS
- EI EXPANSION INDEX
- RV R-VALUE
- CS CORROSION SUITE
- MC MOISTURE CONTENT
- SE SAND EQUIVALENT
- -200 200 WASH
- RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

GEOTECHNICAL BORING LOG B-11

Date 1-12-04 **Sheet** 1 **of** 1

Project Woodside Evans & Garboni **Project No.** 110712-002

Drilling Co. Cal Pac **Type of Rig** B-61

Hole Diameter 8" **Drive Weight** 140 lbs **Drop** 30"

Elevation Top of Hole +/- 1519' **Location** See Map

Logged By AVI

Sampled By AVI

Elevation Feet	Depth Feet	Graphic Log (N S)	Notes	Sample No.	Blows Per Foot	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	DESCRIPTION	Type of Tests
	0							SP	ARTIFICIAL FILL UNDOCUMENTED (Afu) @ Surface: Light brown, damp, loose, fine to coarse SAND	
1515				1	15	110.7	10.4	SM	QUATERNARY ALLUVIUM (Qal) @ 2.5': Brown, moist, loose, fine to coarse SAND with few rootlets and slightly porous	
	5			2	11	107.7	11.3		@ 5': Dark brown, moist, loose, silty, fine SAND with few rootlets	
				3	9	112.7	5.9		@ 7.5': Dark brown, moist, very loose, silty, fine SAND with few rootlets	HCO
1510						122.0	9.3	SP	@ 8.5': Dark brown, moist, very loose, fine to coarse SAND	
	10			4	9				@ 10': Orange to dark gray, moist, very loose, fine to coarse SAND	HCO
									@ 11.5': Orange to dark gray, moist, very loose, fine to coarse SAND with gravels common	
				5	50/5"				CRETACEOUS AGED GRANITIC BEDROCK (Kgr) @ 5': Dark gray, moist, very dense weathered BEDROCK	
1505										
	15								Total Depth 13' No Groundwater Encountered Backfilled with Spoils 1-12-04	
1500										
	20									
1495										
	25									
1490										
	30									

SAMPLE TYPES:

- S SPLIT SPOON
- R RING SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE
- G GRAB SAMPLE
- C CORE SAMPLE

TYPE OF TESTS:

- SU SULFATE
- DS DIRECT SHEAR
- MD MAXIMUM DENSITY
- CN CONSOLIDATION
- CR CORROSION
- HCO HYDROCOLLAPSE
- HD HYDROMETER
- SA SIEVE ANALYSIS
- AL ATTERBERG LIMITS
- EI EXPANSION INDEX
- RV R-VALUE
- CS CORROSION SUITE
- MC MOISTURE CONTENT
- SE SAND EQUIVALENT
- -200 200 WASH
- RDS Remolded DS

LEIGHTON AND ASSOCIATES, INC.

APPENDIX B
LOG OF TEST PITS

Project No. 110712-001
CLIENT: Woodside – Garbani and Evans Road

LOGGED BY: SER
DATE: 6-6-02

TEST PIT#	DEPTH (FT)	DRY DENSITY (PCF)	MOIST (%)	U.S.C.S.	DESCRIPTION
TP-1	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-4			SM	Quaternary Alluvium (Qal): Red-brown, damp to moist, medium dense, silty very fine to medium SAND; moderately porous, scattered root hairs
	4-6				Undifferentiated Granitic Bedrock (Kgr): Gray-brown, very dense, fine to coarse grained GRANITICS; slightly weathered
					TD: 6', No Groundwater, No Caving, Backfilled 6-6-02
TP-2	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-4.5			SM	Quaternary Alluvium (Qal): Red-brown, damp to moist, medium dense, silty very fine to medium SAND; moderately porous, scattered root hairs (large roots at 4.5')
	4.5-6.5				Undifferentiated Granitic Bedrock (Kgr): Gray-brown, very dense, fine to coarse grained GRANITICS, slightly to moderately weathered, scattered cobble sized rock
					TD: 6.5', No Groundwater, No Caving, Backfilled 6-6-02
TP-3	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-12			SM/ML	Quaternary Alluvium (Qal): Red-brown to dark brown, moist, medium dense, silty very fine to medium SAND to sandy SILT; moderately porous in upper 6' then becomes slightly porous, scattered root hairs
	12-14				Undifferentiated Granitic Bedrock (Kgr): Gray-brown, very dense, fine to coarse grained GRANITICS, moderately weathered
					TD: 14', No Groundwater, No Caving, Backfilled 6-6-02

APPENDIX B
LOG OF TEST PITS

Project No. 110712-001
CLIENT: Woodside – Garbani and Evans Road

LOGGED BY: SER
DATE: 6-6-02

TEST PIT#	DEPTH (FT)	DRY DENSITY (PCF)	MOIST (%)	U.S.C.S.	DESCRIPTION
TP-4	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-3			SM	Quaternary Alluvium (Qal): Red-brown, damp, medium dense, silty very fine to medium SAND; moderately porous, scattered root hairs
	3-12			SM/ML	Dark red-brown, moist, medium dense, silty very fine to medium SAND to stiff sandy SILT; slightly porous in upper 5'
	12-14			SP	Light-brown, wet, dense, fine to coarse SAND, highly friable
					TD: 14', Groundwater at 12', No Caving, Backfilled 6-6-02
TP-5	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-3			CL	Quaternary Alluvium (Qal): Dark brown, moist, stiff CLAY; scattered root hairs, non- porous
	3-5			SM	Red-brown, moist, medium dense, silty very fine to medium SAND; slightly clayey, non-porous, scattered gravel
	5-6				Undifferentiated Granitic Bedrock (Kgr): Gray-brown to yellow-brown, very dense, fine to coarse grained GRANITICS, moderately weathered
					TD: 6', No Groundwater, No Caving, Backfilled 6-6-02

APPENDIX B
LOG OF TEST PITS

Project No. 110712-001
CLIENT: Woodside – Garbani and Evans Road

LOGGED BY: SER
DATE: 6-6-02

TEST PIT#	DEPTH (FT)	DRY DENSITY (PCF)	MOIST (%)	U.S.C.S.	DESCRIPTION
TP-6	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-3.5			SM	Quaternary Alluvium (Qal): Red-brown, damp, medium dense, silty very fine to medium SAND; moderately porous, scattered rootlets
	3.5-5				Undifferentiated Granitic Bedrock (Kgr): Gray-brown, very dense, fine to coarse grained GRANITICS; slightly weathered
					TD: 5', No Groundwater, No Caving, Backfilled 6-6-02
TP-7	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-4			SM	Quaternary Alluvium (Qal): Brown, damp, medium dense, silty fine to medium SAND; moderately porous, scattered root hairs, few gravels
	4-7				Undifferentiated Granitic Bedrock (Kgr): Gray-brown to red-brown, very dense, fine to coarse grained GRANITICS, slightly to moderately weathered
					TD: 7', No Groundwater, No Caving, Backfilled 6-6-02
TP-8	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-3.5			SM/SC	Quaternary Alluvium (Qal): Dark brown, moist, medium dense, silty to clayey SAND; slightly porous, scattered root hairs
	3.5-5				Undifferentiated Granitic Bedrock (Kgr): Gray-brown, very dense, fine to coarse grained GRANITICS, slightly weathered
					TD: 5', No Groundwater, No Caving, Backfilled 6-6-02

APPENDIX B
LOG OF TEST PITS

Project No. 110712-001
CLIENT: Woodside – Garbani and Evans Road

LOGGED BY: SER
DATE: 6-6-02

TEST PIT#	DEPTH (FT)	DRY DENSITY (PCF)	MOIST (%)	U.S.C.S.	DESCRIPTION
TP-9	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-3			SC	Quaternary Alluvium (Qal): Dark brown, moist, medium dense, clayey SAND; slightly porous, abundant root hairs
	3-5				Undifferentiated Granitic Bedrock (Kgr): Gray-brown, very dense, fine to coarse grained GRANITICS, slightly weathered
					TD: 5', No Groundwater, No Caving, Backfilled 6-6-02
TP-10	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-3			SM	Quaternary Alluvium (Qal): Dark brown, damp, medium dense, silty very fine to medium SAND; moderately porous, abundant root hairs
	3-5				Undifferentiated Granitic Bedrock (Kgr): Gray-brown to red-brown, very dense, fine to coarse grained GRANITICS, slightly to moderately weathered
					TD: 5', No Groundwater, No Caving, Backfilled 6-6-02
TP-11	0-1			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1-4			SM	Quaternary Alluvium (Qal): Red-brown, damp, medium dense, silty very fine to medium SAND; moderately porous, few gravel scattered root hairs
	4-8			SC	Dark brown, moist, medium dense, clayey SAND; slightly porous
	8-10				Undifferentiated Granitic Bedrock (Kgr): Gray to olive-brown, moist, dense, fine to medium grained GRANITICS, highly weathered
					TD: 10', No Groundwater, No Caving, Backfilled 6-6-02

APPENDIX B
LOG OF TEST PITS

Project No. 110712-001
CLIENT: Woodside – Garbani and Evans Road

LOGGED BY: SER
DATE: 6-6-02

TEST PIT#	DEPTH (FT)	DRY DENSITY (PCF)	MOIST (%)	U.S.C.S.	DESCRIPTION
TP-12	0-1.5			SM	Tilled Zone: Light brown, dry, loose, silty fine to coarse SAND; abundant rootlets
	1.5-5			SM	Quaternary Alluvium (Qal): Brown, damp, medium dense, silty fine to medium SAND; moderately porous, few gravel, scattered root hairs
	5-11			SM	Undifferentiated Granitic Bedrock (Kgr): Red-brown, damp, dense, silty fine to coarse SAND, calcium carbonate faces, non-porous, highly weathered
	11-12				Gray-brown, very dense, fine to coarse grained GRANITICS; slightly weathered
					TD: 12', No Groundwater, No Caving, Backfilled 6-6-02

Appendix C

APPENDIX C

Laboratory Testing Procedures and Test Results

Atterberg Limits: The Atterberg Limits were determined in accordance with ASTM Test Method D423 for engineering classification of the fine-grained materials and presented in the table below:

Sample Location	Liquid Limit (%)	Plastic Limit (%)	Plastic Index (%)	USCS Soil Classification
B-6 @ 4'	-	-	NP	SM

Moisture and Density Determination Tests: Moisture content and dry density determinations were performed, in general accordance with ASTM test method D2937, on relatively undisturbed samples obtained from the test borings and/or trenches. The results of these tests are presented in the boring and/or trench logs. Where applicable, only moisture content was determined from "undisturbed" or disturbed samples.

Compaction Characteristics: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM Test Method D 1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-1 @ 0-10'	Gray-brown silty SAND (SM)	127.0	11.0
B-6 @ 5-10'	Brown silty SAND (SM)	134.0	9.0

Expansion Index Tests: The expansion potential of selected materials was evaluated by the Expansion Index Test, ASTM D4829. Specimens were molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation. The prepared 1-inch thick by 4-inch diameter specimens were loaded to an equivalent 144 psf surcharge and inundated with tap water until volumetric equilibrium was reached. The results of these tests are presented in the table below:

Sample Location	Sample Description	Expansion Index	Expansion Potential
B-6 @ 5-10'	Brown silty sand (SM)	5	Very Low
TP-7 @ 0-5'	Reddish brown silty SAND (SM)	8	Very Low

Laboratory Testing (continued)

Hydrocollapse Tests: Hydrocollapse tests were performed on selected, relatively undisturbed ring samples. Samples were placed in a consolidometer and loads were applied in geometric progression. The percent hydrocollapse for each load cycle was recorded as the ratio of the amount of vertical compression to the original 1-inch height. The hydrocollapse pressure curves are presented in the test data. Where applicable, time-rates of hydrocollapse were recorded and presented below:

Sample Location	Sample Description	Dry Density (before test) (pcf)	% Hydrocollapse
B-5 @ 5'	Brown silty SAND (SM)	126.4	-0.80
B-5 @ 7.5'	Dark brown silty SAND (SM)	124.2	-0.15
B-6 @ 5'	Light brown to dark gray silty SAND (SM)	117.6	-1.64
B-7 @ 5'	Red brown silty SAND (SM)	107.8	-2.40
B-11 @ 7.5'	Dark brown silty SAND (SM)	122.0	-0.06
B-11 @ 10'	Orange to dark gray silty SAND (SM)	112.7	-0.71
TP-1 @ 3-4'	Red brown silty SAND (SM)	105.3	-3.53
TP-4 @ 5-6'	Dark red brown silty SAND (SM)	102.7	-0.91
TP-8 @ 3-4'	Dark brown silty SAND (SM)	109.2	-1.63

Chloride Content, Sulfate Content, Minimum Resistivity and pH Tests: Chloride content, Sulfate Content, Minimum resistivity and pH tests were performed in general accordance with California Test Method 422, 417, and 532. The results are presented in the table below:

Sample Location	Sample Description	Chloride Content (ppm)	Sulfate Content (%)	pH	Minimum Resistivity (ohms-cm)
B-6 @ 5-10'	Red brown silty SAND (SM)	30	<0.0150	8.64	11,679
TP-1 @ 0-3'	Brown silty SAND (SM)		<0.0150		
TP-7 @ 5-7'	Light brown silty SAND (SM)		<0.0150		

Laboratory Testing (continued)

Direct Shear Tests: Direct shear tests were performed, in general accordance with ASTM test method D3080, on selected remolded and/or undisturbed samples which were soaked for a minimum of 24 hours under a surcharge equal to the applied normal force during testing. After transfer of the sample to the shear box and reloading the sample, pore pressures set up in the sample due to the transfer were allowed to dissipate for a period of approximately 1 hour prior to application of shearing force. The samples were tested under various normal loads, a motor-driven, strain-controlled, direct-shear testing apparatus at a strain rate of approximately 0.05 inch per minute. The test results are presented in the test data.

Sample Location	Sample Description	Friction Angle (degrees)		Apparent Cohesion (psf)	
		Peak	Relaxed	Peak	Relaxed
B-1, @ 0-10'	Gray brown silty SAND (SM) Remolded	27	23	625	500
B-1, @ 7.5'	Yellow gray brown silty SAND (SM)	48	37	1700	400
TP-8 @ 5-7'	Gray brown to red brown silty SAND (SM), Remolded	44	350	41	350

Maximum Density Tests: A maximum dry density and optimum moisture content of typical materials was determined in accordance with ASTM Test Method D1557. The results of this test are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-1 @ 0-10'	Gray brown silty SAND, (SM)	127.0	11.0
B-6 @ 5-10'	Light brown silty SAND, (SM)	134.0	9.0
TP-7 @ 0-5 ft	Light brown silty SAND (SM)	133.0	9.0

Appendix D

Sub Surface Surveys

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June 25, 2002

Leighton and Associates
41715 Enterprise Circle N., Suite 103
Temecula, CA 92590-5661

Project No. 02-213

Attn: **Scott Richtmyer**

re: Seismic refraction investigation, Menifee CA

This brief letter report is to present the findings of a seismic refraction survey carried out on a construction site at Garbani Road and Ascot Way in Menifee, California (Fig.1) on June 3, 2002. The survey consists of eight lines, each of single spreads. Purposes of the survey were to determine the mechanical properties of the geologic section, layer depths and their thicknesses, and estimate rippability.

A Bison 9024, 24 channel seismograph system, was applied to the task. This instrument has DIFP, digital instantaneous floating point. This translates into a computer-controlled seismograph that records incoming signals at all instrument settings, and these are analyzed by the on-board computer which then outputs optimum, balanced traces with maximum informational content.

Survey Design – The Line Location Map (Fig. 2) shows the positions and layout directions of the eight refraction lines. Four of the lines are in relatively flat areas, and four are on the southwest slope of a bedrock ridge. Cut slopes up to 40 feet deep are planned, and the line lengths are designed to investigate to depth in the order of 75 feet.

Geophone interval was 10 feet on all lines; consequently, spread lengths were 250 feet, measured from off end shot to far offset geophone. Shots were also 10 feet from near offset geophones. In addition to forward and reverse off end shots, a split spread shot was fired between geophones 12 and 13. The geophone gap at the split spread position was 20 feet to accommodate the shot.

Source was a heavy duty sledge hammer with an inertial switch. The hammer was slammed onto a metal plate that was coupled to the ground. Because of the relatively short spreads, the sledge hammer source was entirely adequate. Vertical stacking was carried out to build energy and to serve as an effective "noise" abatement strategy in spite of low ambient and cultural noise. With a computer "picking" program that has zoom, filtering, gain, trace isolation and balancing, and other features, there was no difficulty in picking any of the lines.

Elevations of all shot and geophone positions were surveyed in, and then input into the modeling program. Elevation of the forward shot point was arbitrarily taken to be zero feet, and then all other elevations along the given line were relative to this assumed value at the forward shot point. The line positions were then registered to a detailed topographic map (see the line

Sub Surface Surveys

SITE LOCATION MAP

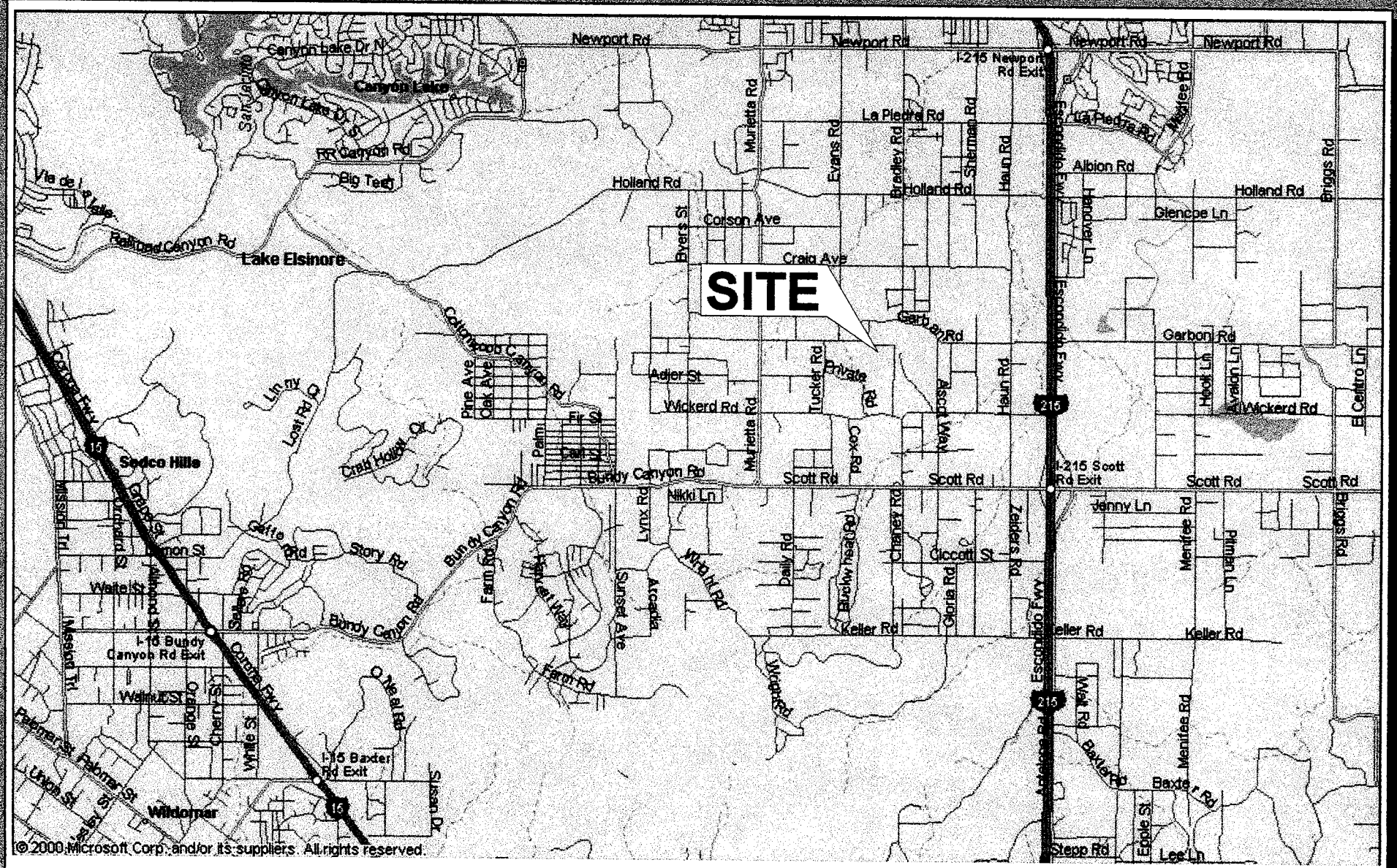


FIGURE 1

Sub Surface Surveys

LINE LOCATION MAP

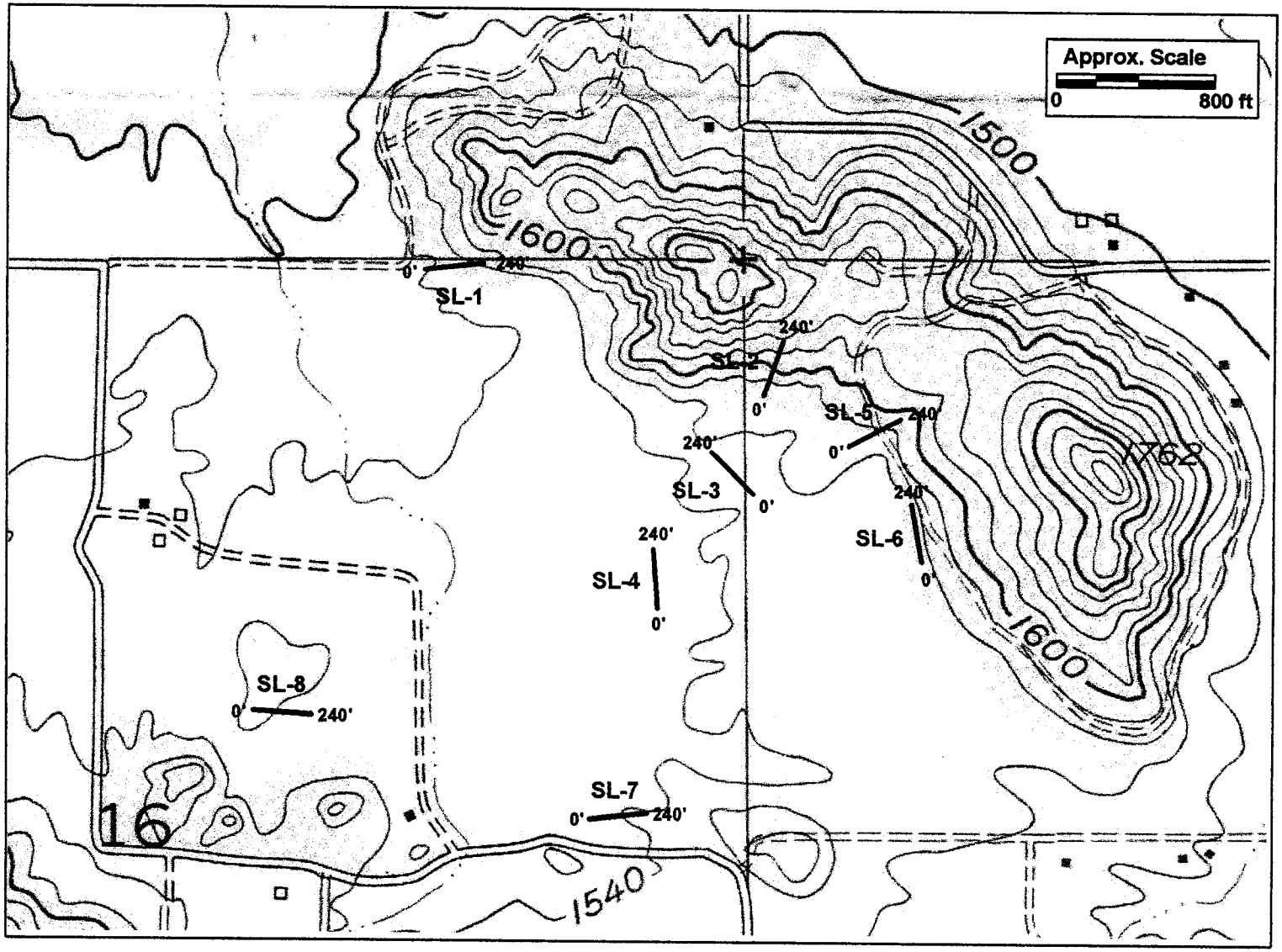


FIGURE 2

location map, Fig. 2), and the arbitrary elevations were converted to absolute. Stakes were planted in the ground at the positions of the off end shots.

Brief Description of the Geophysical Method Applied – Seismic refraction investigates the subsurface by generating arrival time and offset distance information to determine the path and velocity of an elastic disturbance in the ground. The disturbance is created by shot, hammer, weight drop, or some comparable method for putting impulsive energy into the ground. Detectors are laid out at regular intervals in a line to measure the first arrival energy and the time of its arrival. The data are plotted in time-distance graphs, from which velocity of, and depth to, layers can be calculated. This is possible because rays (a continuum point on an expanding wave front) of the disturbance wave follows a direct route and is the first arrival energy at the close-in geophones. And the rays are refracted across layer boundaries where there is a difference in elastic and density properties. The critically refracted ray travels along the layer interface, at the speed of the lower layer, and continuously "feeds" energy back to the surface, to be successively detected by the line of geophones.

Shot are normally reversed from one end of the line to the other, to determine whether or not the layering is horizontal or dipping. And the split spread shot gives redundancy to improve the interpretation. The acquired data are computationally int ense. A ray-tracing computer program, SIPT2 in this instance, is used to iteratively honor all refracting surfaces, velocities, and to be able to consider a large number of layers, where they are present. A first energy arrival picking program, with such features as zoom, filtering, time stretching, separation of traces, AGC and balancing of traces, is also applied.

An independent approach to the analysis of seismic refraction data was applied to several of the spreads. It is referred to as the "Optimized Velocity Model", wherein the subsurface is mapped in terms of velocity classes. It is apparent that highest velocities are associated with the mechanically strongest rocks. The boundaries between velocity classes are determined as the least squares minimum velocity variation for all paths that converge at an array of points, each determined independently in turn. These displays, when compared to the "traditional" seismic sections, strengthen confidence in the interpretation when they converge to a common solution.

Interpretation – Monitor records are produced in the field with each shot (Fig. 3). These are prints of the raw data as it comes in to the recorder. They show the quality of the data, so that the operator can determine whether or not the data are pickable, or shots need to be repeated. Two representative monitor records are illustrated, a mid split spread shot from line SL-8, and a forward shot from line SL-4. All arrivals are seen to be readily pickable on these raw records, although very minor wind and traffic noise is subtly detectable on the far offset traces.

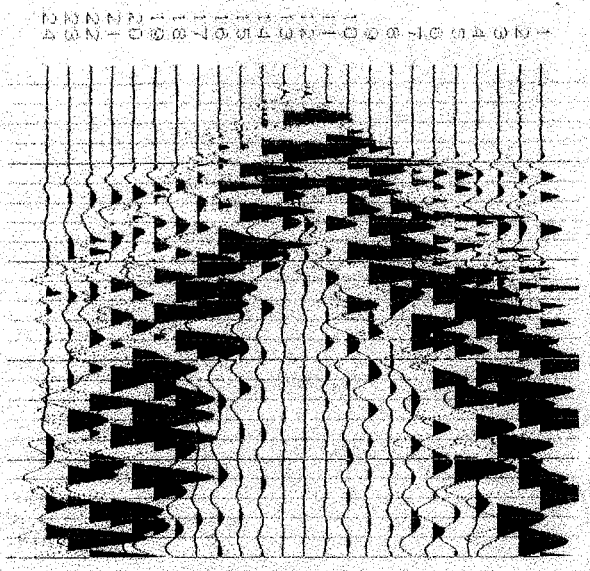
More of the shooting parameters are listed below the monitor records (Fig. 3).

The first pick information, geophone positions, shot locations and geometry of the spreads are input to a routine that produces a time-distance plot (e.g. line 7 data, Fig. 4). The four curves express the wave arrivals from the three shots, forward, reverse, and a split spread. The split spread, however, produces two curves each going in opposite directions. The data, at this location, show slightly irregular plots and a subtly asymmetrical three-layer case, as is apparent from the three generalized straight lines superimposed on the forward curve.

The slight asymmetry and irregularity of the group of curves indicates that the layers are not

Sub Surface Surveys

MONITOR RECORDS



BISON 9000 SERIES

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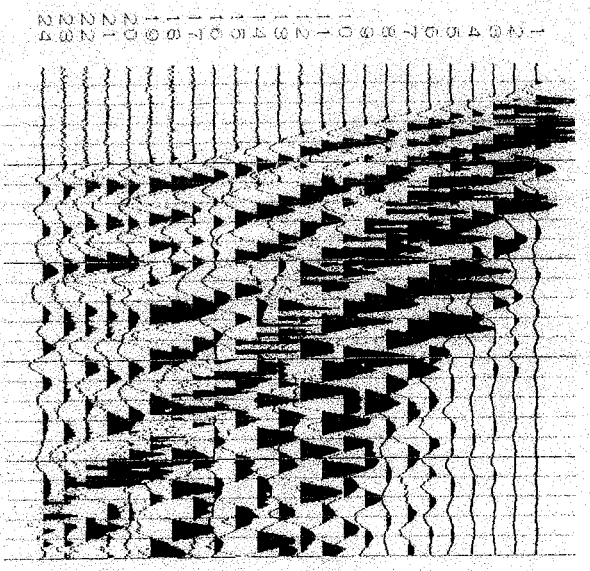
Delay(ms)		DFhc	Out
Channels	24	DFnt	Out
Samples	500	DFbp	Out
Rec len	250ms	Agc	Off

Time scale = 10 (ms)/division.

PCH	GN	STK	EX	PCH	GN	STK	EX
+ 01	M	0002	06	+ 13	M	0002	13
+ 02	M	0002	07	+ 14	M	0002	11
+ 03	M	0002	07	+ 15	M	0002	11
+ 04	M	0002	08	+ 16	M	0002	10
+ 05	M	0002	07	+ 17	M	0002	10
+ 06	M	0002	08	+ 18	M	0002	09
+ 07	M	0002	09	+ 19	M	0002	08
+ 08	M	0002	10	+ 20	M	0002	07
+ 09	M	0002	10	+ 21	M	0002	07
+ 10	M	0002	10	+ 22	M	0002	07
+ 11	M	0002	11	+ 23	M	0002	07
+ 12	M	0002	13	+ 24	M	0002	08



BISON 9000 SERIES

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Sample rt	.500ms	DFlc	Out
Delay(ms)		DFhc	Out
Channels	24	DFnt	Out
Samples	500	DFbp	Out
Rec len	250ms	Agc	Off

Time scale = 10 (ms)/division.

PCH	GN	STK	EX	PCH	GN	STK	EX
+ 01	M	0003	13	+ 13	M	0003	06
+ 02	M	0003	11	+ 14	M	0003	05
+ 03	M	0003	09	+ 15	M	0003	05
+ 04	M	0003	10	+ 16	M	0003	06
+ 05	M	0003	09	+ 17	M	0003	05
+ 06	M	0003	08	+ 18	M	0003	04
+ 07	M	0003	07	+ 19	M	0003	04
+ 08	M	0003	08	+ 20	M	0003	05
+ 09	M	0003	07	+ 21	M	0003	04
+ 10	M	0003	07	+ 22	M	0003	04
+ 11	M	0003	06	+ 23	M	0003	04
+ 12	M	0003	06	+ 24	M	0003	05

FIGURE 3

Sub Surface Surveys

SEISMIC REFRACTION DATA

Time-Distance Graph

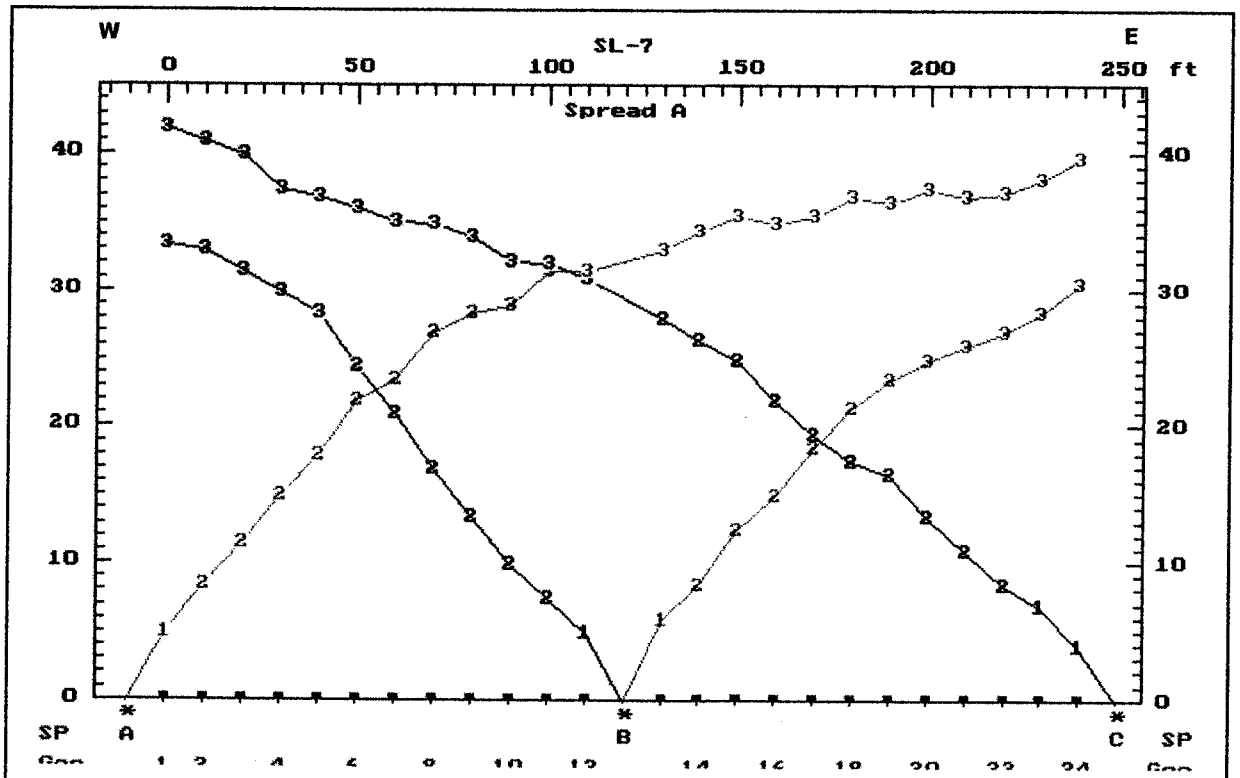


FIGURE 4

uniform and horizontal. Minor undulations in the curves, based on the raw data, are, to some extent, explained by the fact that elevation corrections are not yet applied to the data in the time-distance plot. And some of the irregularity is explained by lateral velocity changes. Minor variations in the positions of the "dog-legs" in the several curves are mostly an expression of the laterally changing thicknesses of the upper layers.

Models were calculated for the five lines of data (Figs. 5-12). All lines show a three layer case. The site appears to be on relatively rare basic instrusive rock, within the dominantly granitic Peninsula Ranges batholith. The topmost layer probably consists of some combination of soil and colluvium essentially undisturbed. Average velocity of the top layer is in the order of 1720 ft/sec, with moderate variation. This value is typical for soil/colluvial materials over the batholith. Average thickness is approximately 9 feet, but the range is from feather edge to 15 feet. This is not surprising owing to the relief and the presence of outcrops in the bedrock ridge. Generally the boundaries tend to mimic the ground surface profile. This is to be expected when weathering processes play a significant role in the development of boundaries.

The second layer has an average thickness, where sampled, of approximately 40 feet, but ranges from 1 to over 50 feet. Layer 2 appears to be weathered bedrock. Fracturing, relief, facing slope, vegetation, lithology and other factors all contribute to variability of weathering. Fracturing in crystalline rocks is usually an important factor in that fracture zones admit air and water to deeper levels, resulting in deeper weathering. Average velocity of layer 2 is near 3780 ft/sec, where sampled. The two westmost lines, SL-1 and SL-8, are aberrations, however, with velocities in the 5000 ft/sec range. The site is near the apparent boundary between the basic igneous rocks and the granitic clan rocks; possibly, the two anomalous lines are on granitics.

A third layer is continuous downward, presumably to much greater depths than the depth of investigation, which is approximately 75 feet. Velocity of this material is in the order of 8935 ft/sec, with a fairly large range. This may further indicate that the site spans the boundary between two rock types. In fact third layer velocities beneath lines SL-1 and SL-8 are abnormally high, similar to layer 2 velocities. The batholith, as aforementioned, is obviously a composite entity, having discrete bodies with somewhat different chemistry, which would, in turn, equate to different mechanical properties and weathering characteristics.

It is highly probable that the geologic interpretations of the topmost and lowest layers detected are correct; that is, the top layer is soil/colluvium and the deepest layer is unweathered crystalline intrusive rocks. It follows, therefore, that the middle layer is a weathered version of the third layer.

It is clear from the Caterpillar Rippability Chart (Fig. 13) that layer 1 is rippable everywhere, and layer 2 is rippable with heavier equipment. Layer 3 is hard, unweathered, mechanically strong rock, relatively unfractured where the higher velocities were measured, and should be considered non-rippable everywhere. The Caterpillar Chart is empirical, but is based on thousands of samples of velocity vs rippability in terms of performance of various sized Cats. The chart illustrated is for a D9 Caterpillar.

Sub Surface Surveys

SEISMIC REFRACTION DATA

Line Distance and Elevation in Feet

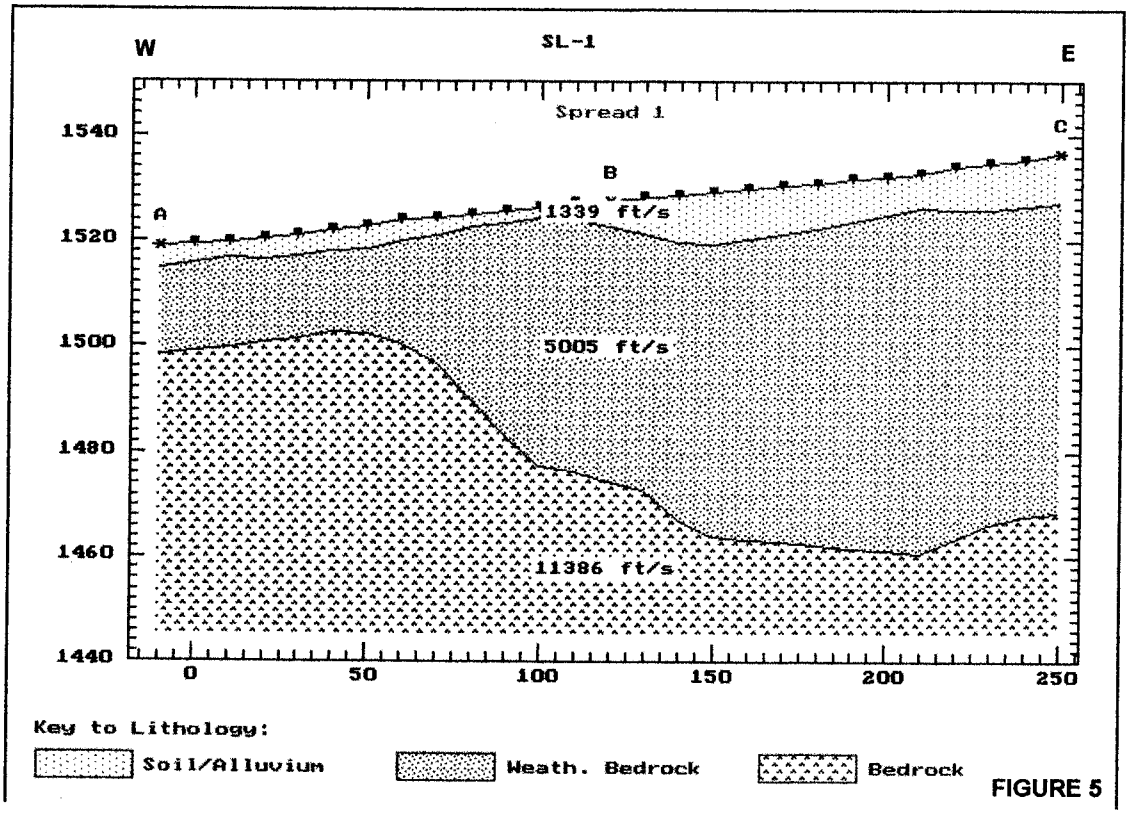


FIGURE 5

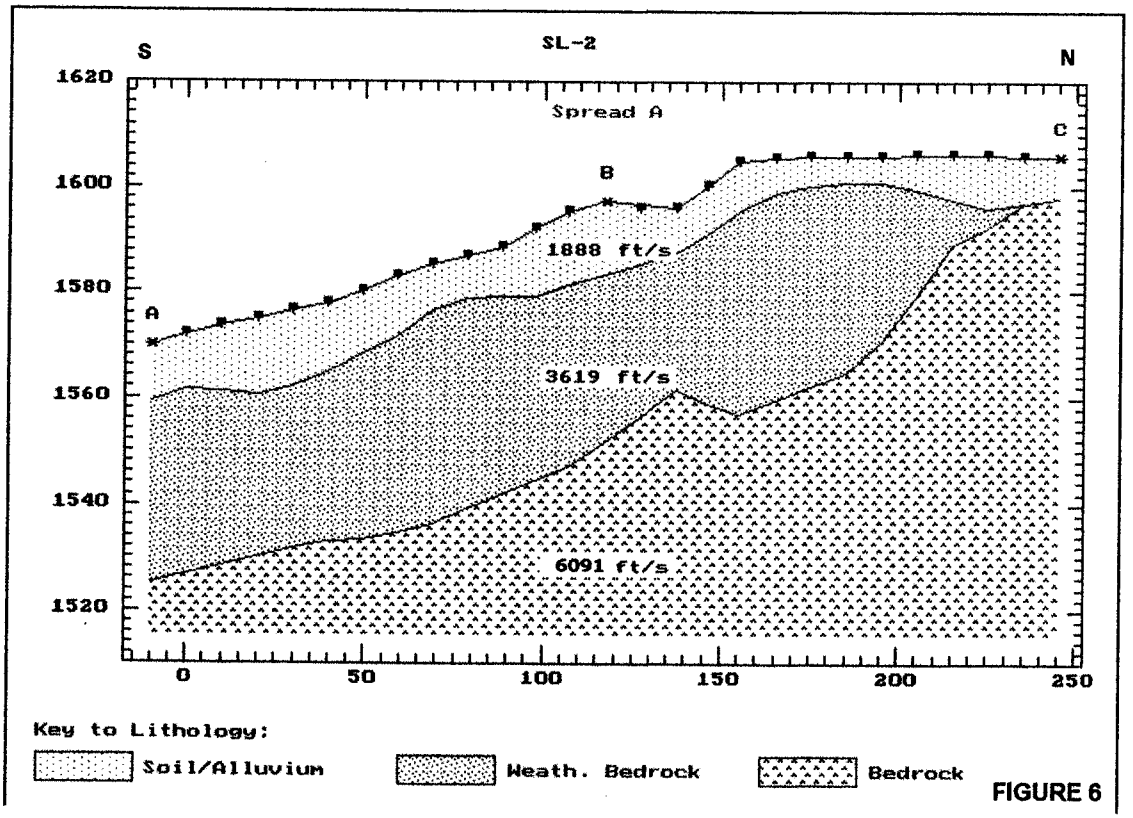


FIGURE 6

Sub Surface Surveys

SEISMIC REFRACTION DATA

Line Distance and Elevation in Feet

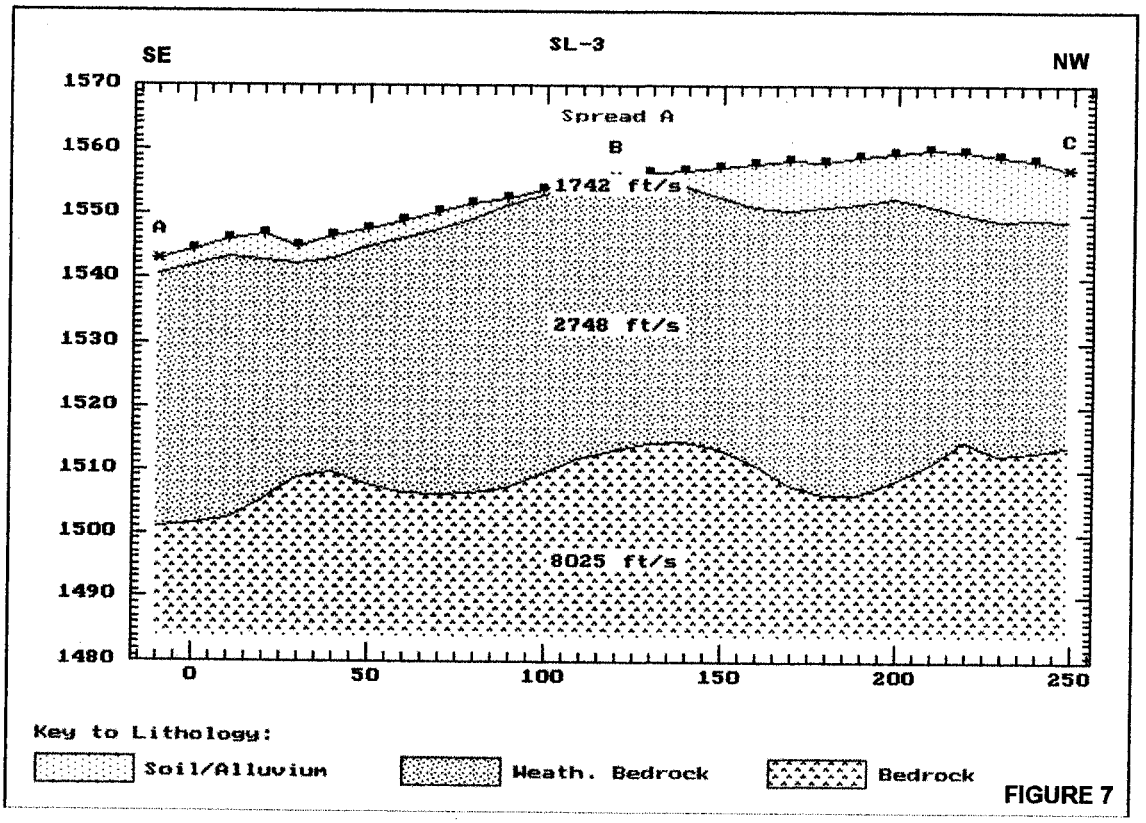


FIGURE 7

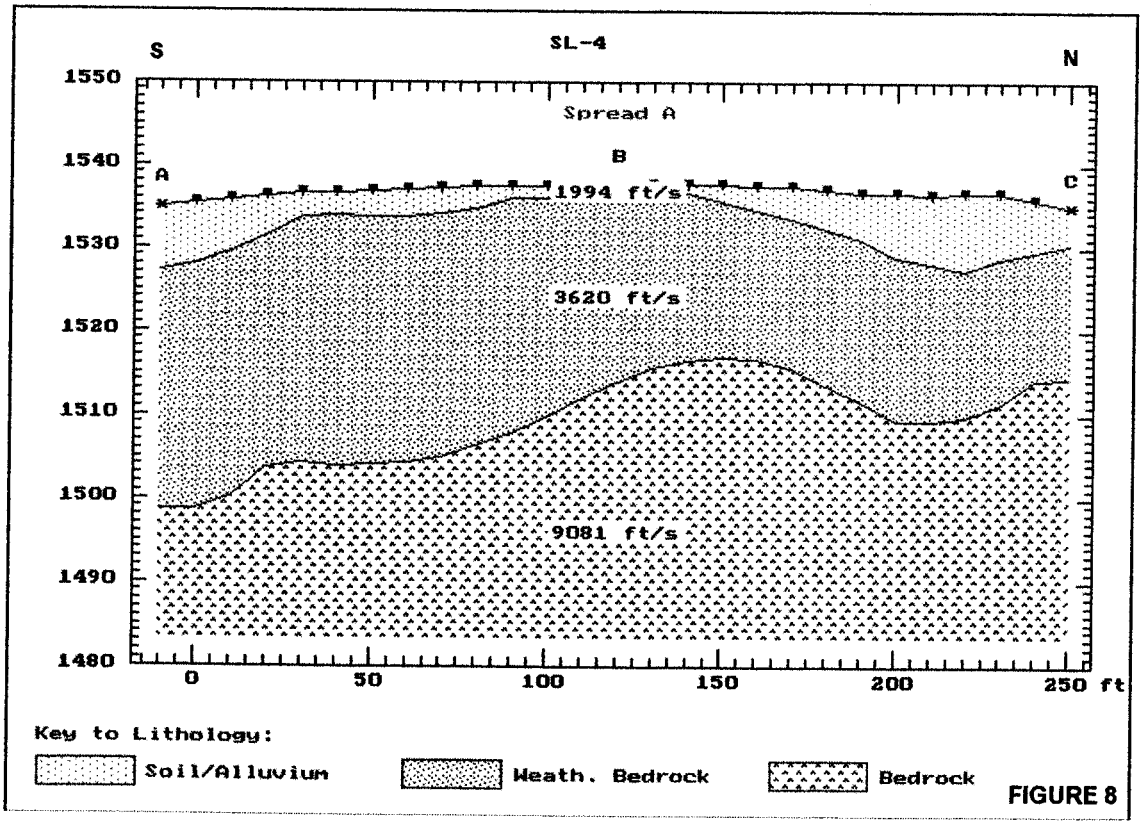


FIGURE 8

Sub Surface Surveys

SEISMIC REFRACTION DATA

Line Distance and Elevation in Feet

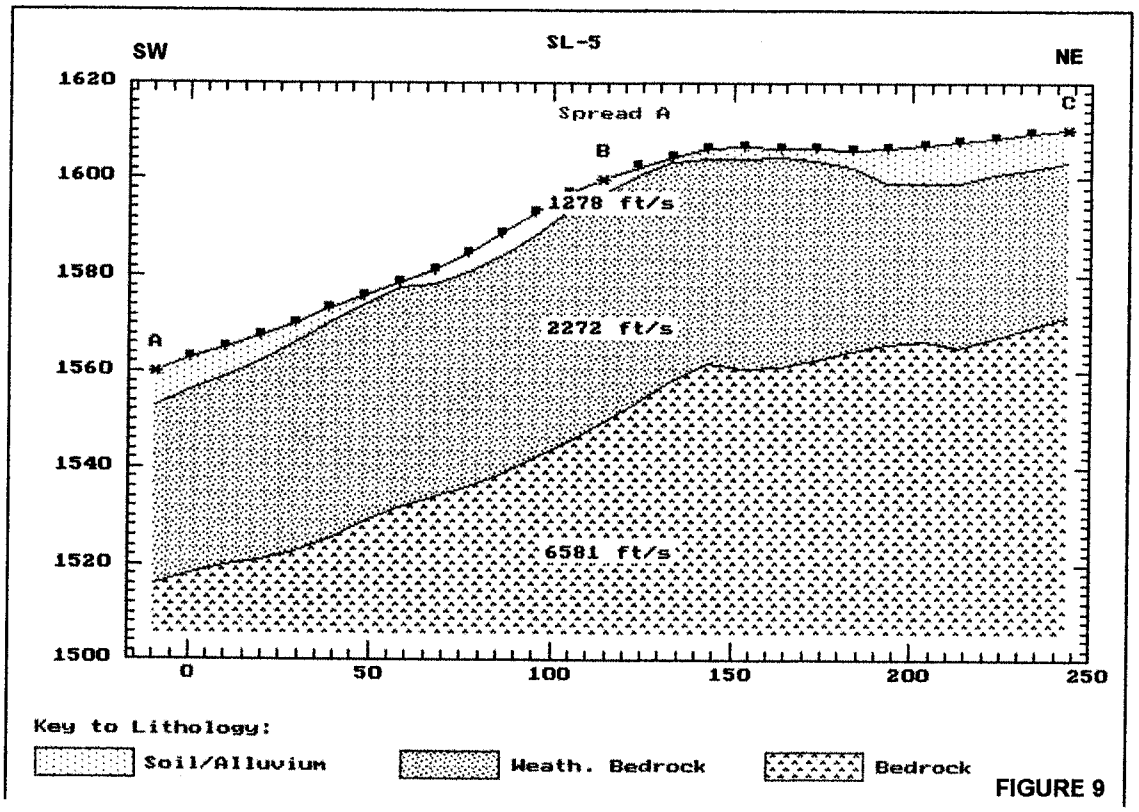


FIGURE 9

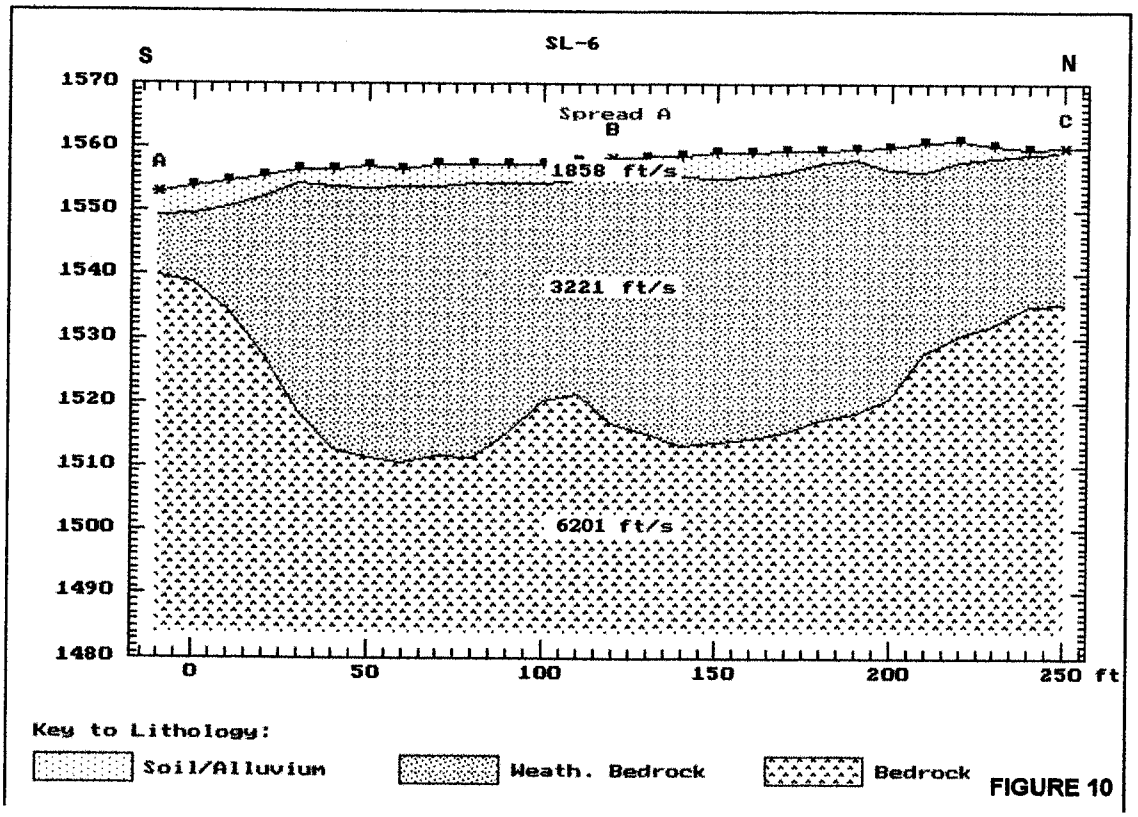


FIGURE 10

Sub Surface Surveys

SEISMIC REFRACTION DATA

Line Distance and Elevation in Feet

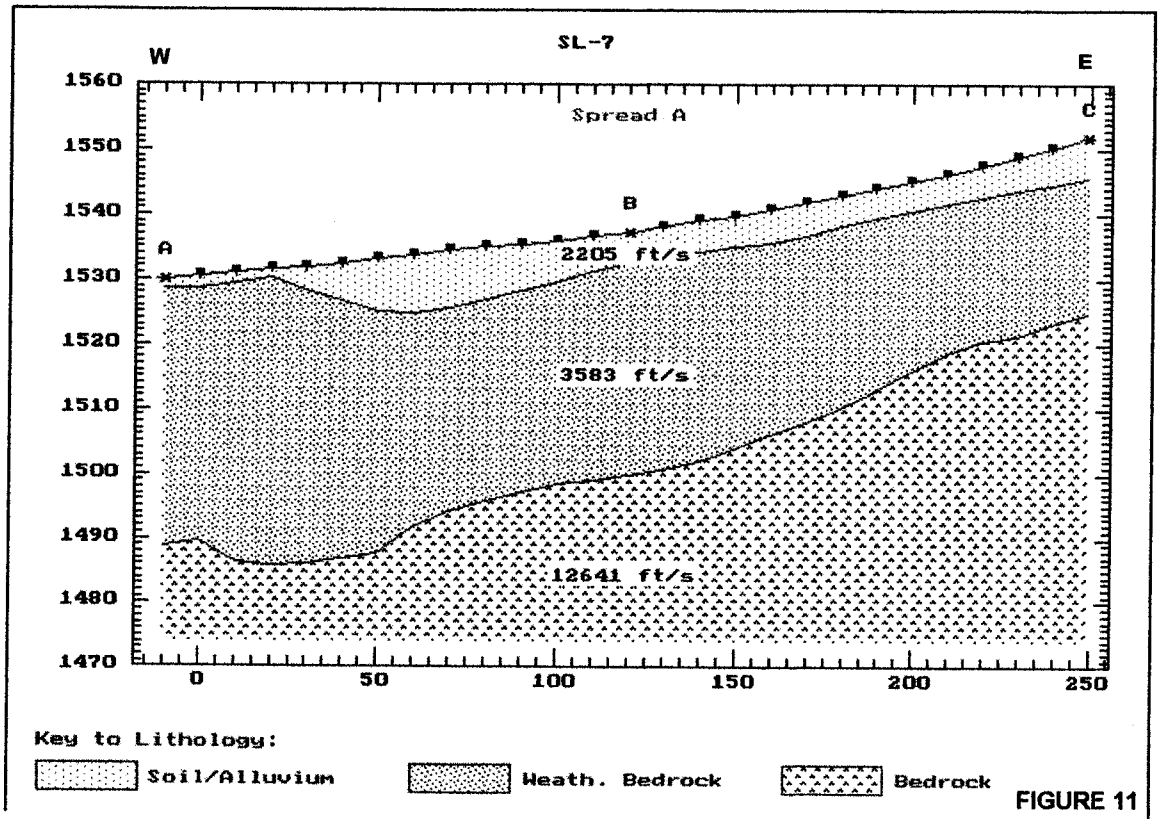


FIGURE 11

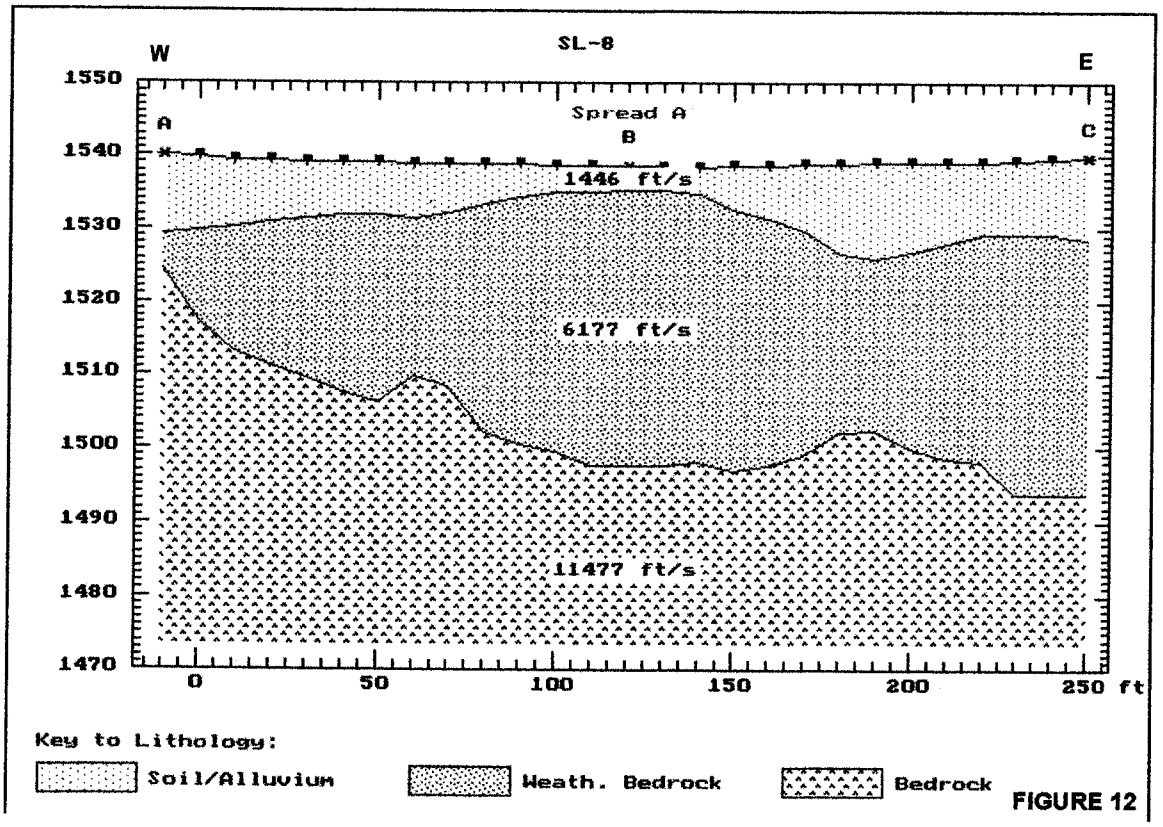


FIGURE 12

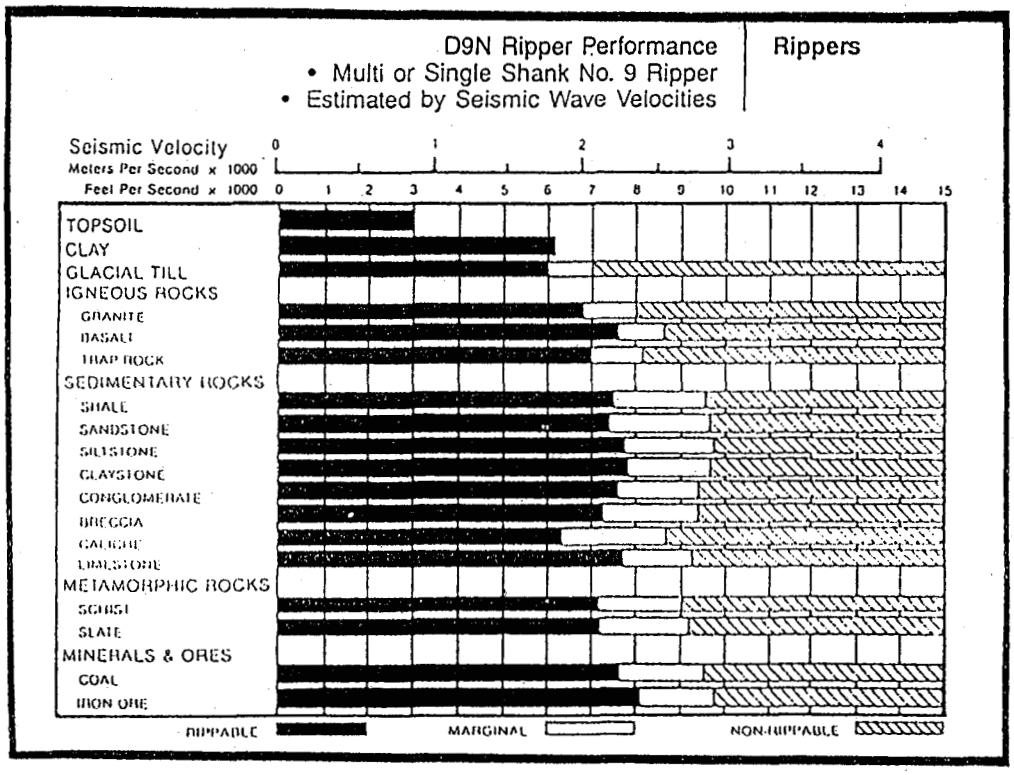


Figure 13. Caterpillar Rippability Chart

Subsurface Surveys professional personnel are trained and experienced and have completed thousands of projects since the company's inception in 1988. It is our policy to work diligently to bring this training and experience to bear to acquire quality data sets, which in turn, can provide clues useful in formulating our interpretations. Still, non-uniqueness of interpretations, methodological limitations, and non-target interferences are prevailing problems. SubSurface Surveys makes no guarantee either expressed or implied regarding the accuracy of the interpretations presented. And, in no event will SubSurface Surveys be liable for any direct, indirect, special, incidental, or consequential damages resulting from interpretations and opinions presented herewith.

Conclusions – The seismic data appear to indicate that there are three geologic layers present at the site, namely soil/colluvium, weathered bedrock and unweathered bedrock of both basic and granitic clan composition. Only the deepest layer, composed of unweathered crystalline rocks, is non-rippable, but the nearest it comes to the surface (where sampled) is approximately 16 feet under line SL-8. Depth to layer 3 is about 65 feet at its maximum under line SL-1. Inasmuch as line SL-8 is located in fairly flat terrain, it does not appear likely that drilling and blasting will be required.

All data acquired in this project are in confidential file in the office. They are available for review by authorized persons at any time. The opportunity to participate in this project is very much appreciated. Please call, if there are questions.

Gary W. Crosby

Gary W. Crosby, PhD, GP 960

Appendix E

APPENDIX E

Static and Pseudostatic Slope Stability Analysis

Stability of the proposed slopes was evaluated under static and pseudostatic loading conditions using GSTABL7. The GSTABL7 program provides a general solution of the slope stability problems using a two-dimensional limit equilibrium method. For pseudostatic analysis, a static lateral force equivalent to 0.15 times the acceleration due to gravity was used. No correction for increased shear strength under seismic loading was applied for these analyses.

Our analysis utilized shear strength parameters based on shear test data from this investigation (Appendix C) and Leighton's previous experience on similar sites. Shear strength parameters used in the analysis are as follows:

	Cohesion (psf)	Friction Angle
Weathered Granitic Bedrock	400	37
Artificial Fill [1]	380	26

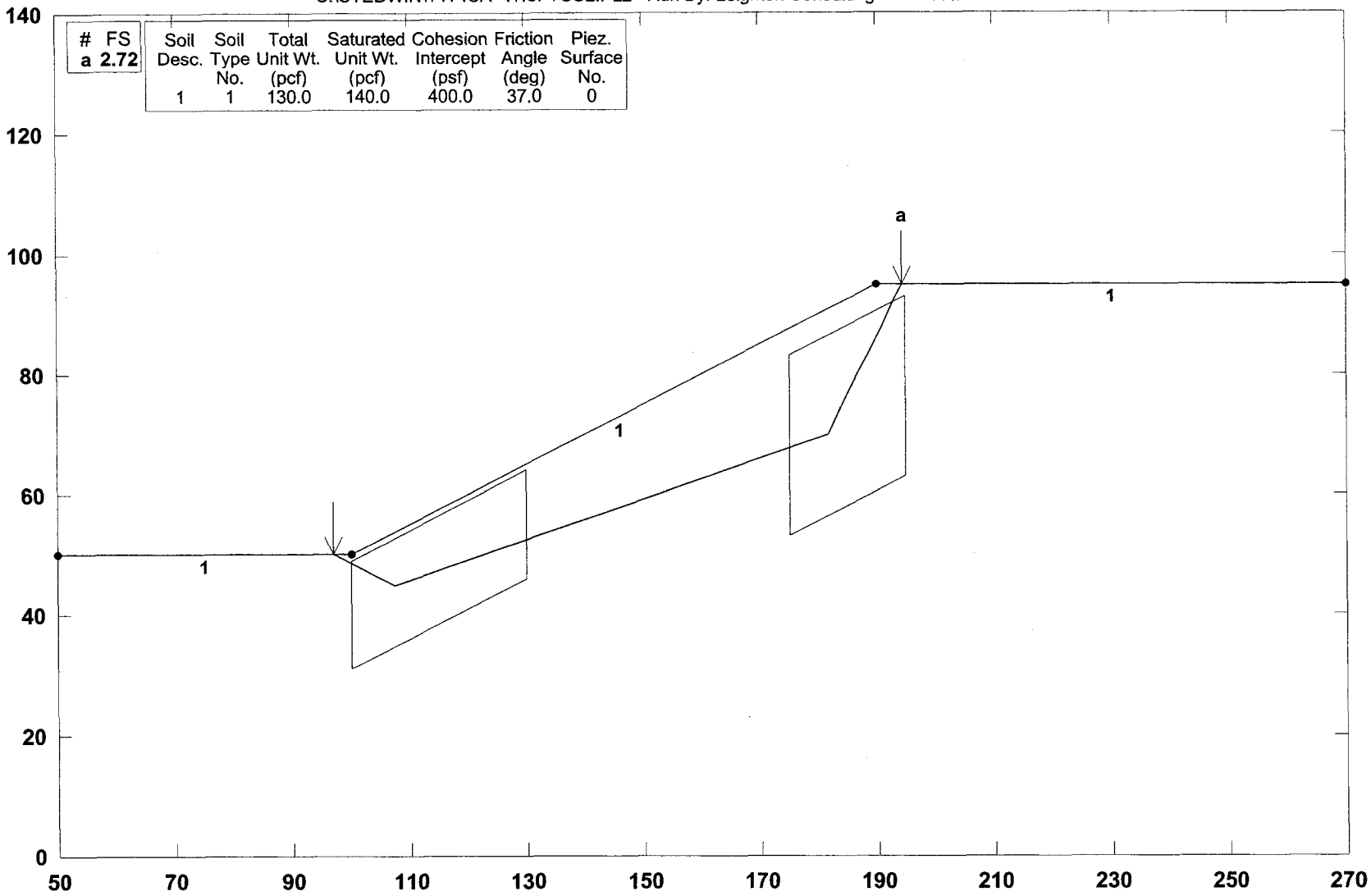
Slope Section	Factor of Safety	
	Gross Stability Static	Gross Stability Pseudostatic
Maximum fill slope, 30 ft. @ 2:1	2.72	1.98
Maximum cut slope, 45 ft. @ 2:1	2.15	1.55

A surficial analysis was also performed for the anticipated 2:1 slopes. For this analysis, an assumed 4-foot depth of saturation was utilized along with the fill soil strength parameters indicated above.

Slope Section	Factor of Safety for Surficial Stability
Fill slope @ 2:1	2.3
Cut slope @ 2:1	2.6

Woodside/Evans & Earbani 110712-002 45 ct Cut slope

C:\STEDWIN\TYPICA~1\45FTCSL.PL2 Run By: Leighton Consulting Inc. 1/30/2004 3:01PM



GSTABL7 v.2 FSmin=2.72

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

GSTABL7

Woodside/Evans & Earbani 110712-002 45 ct Cut slope

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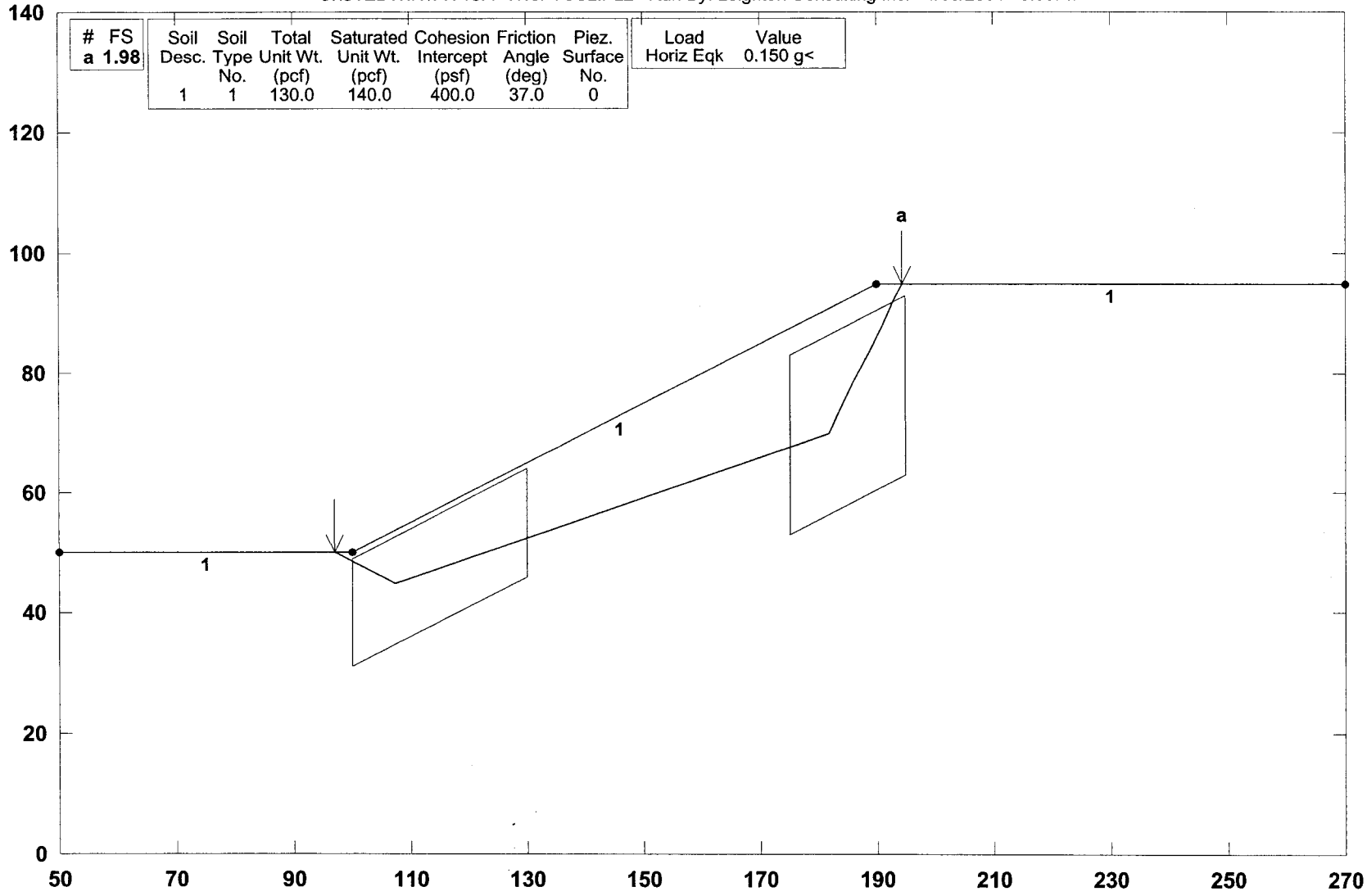

GSTABL7 v.2 FSmin=1.98

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

GSTABL7

Woodside/ Evans & Earbani 110712-002 30 ft fill slope

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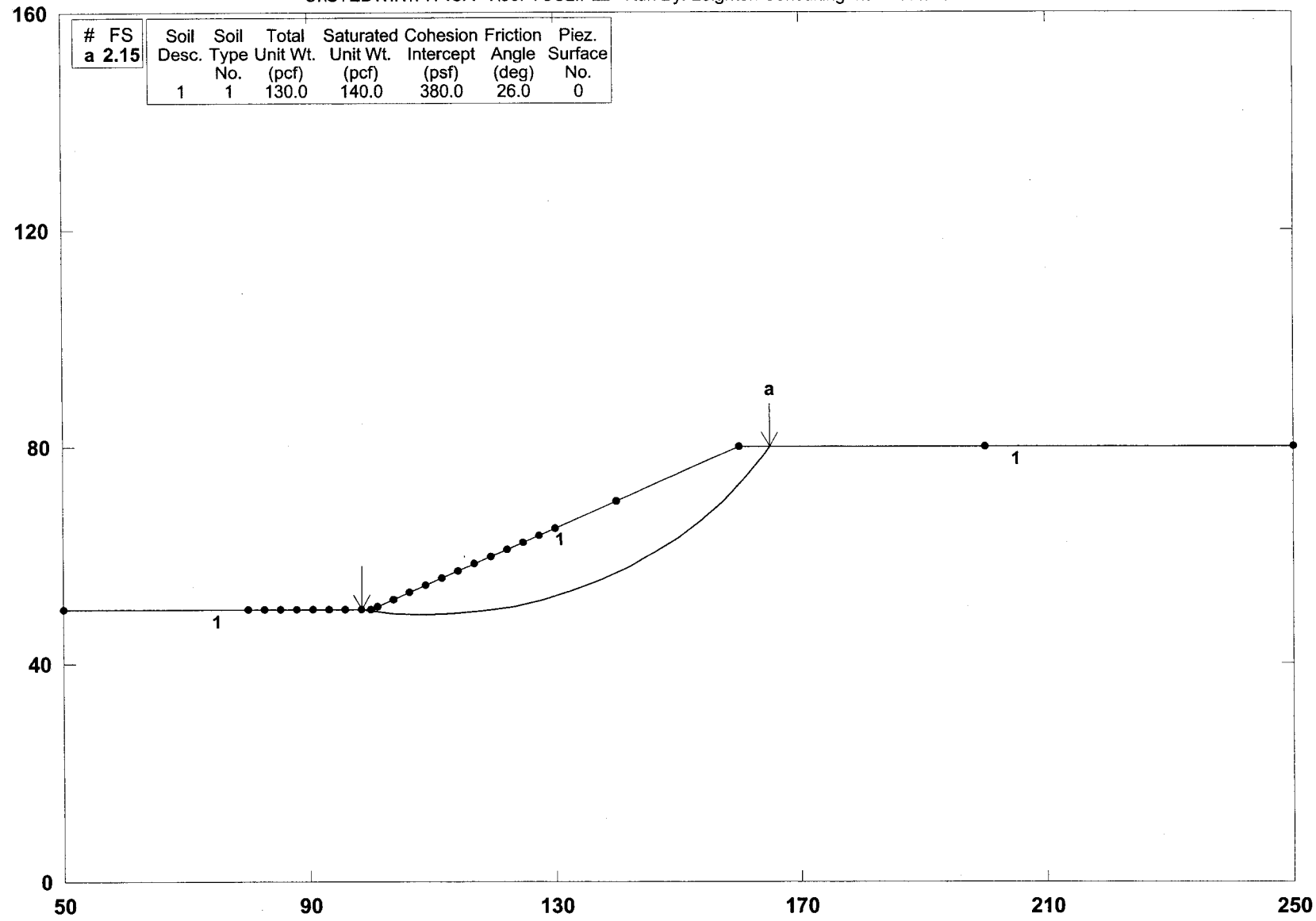


# FS a 2.15	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
	1	1	130.0	140.0	380.0	26.0	0

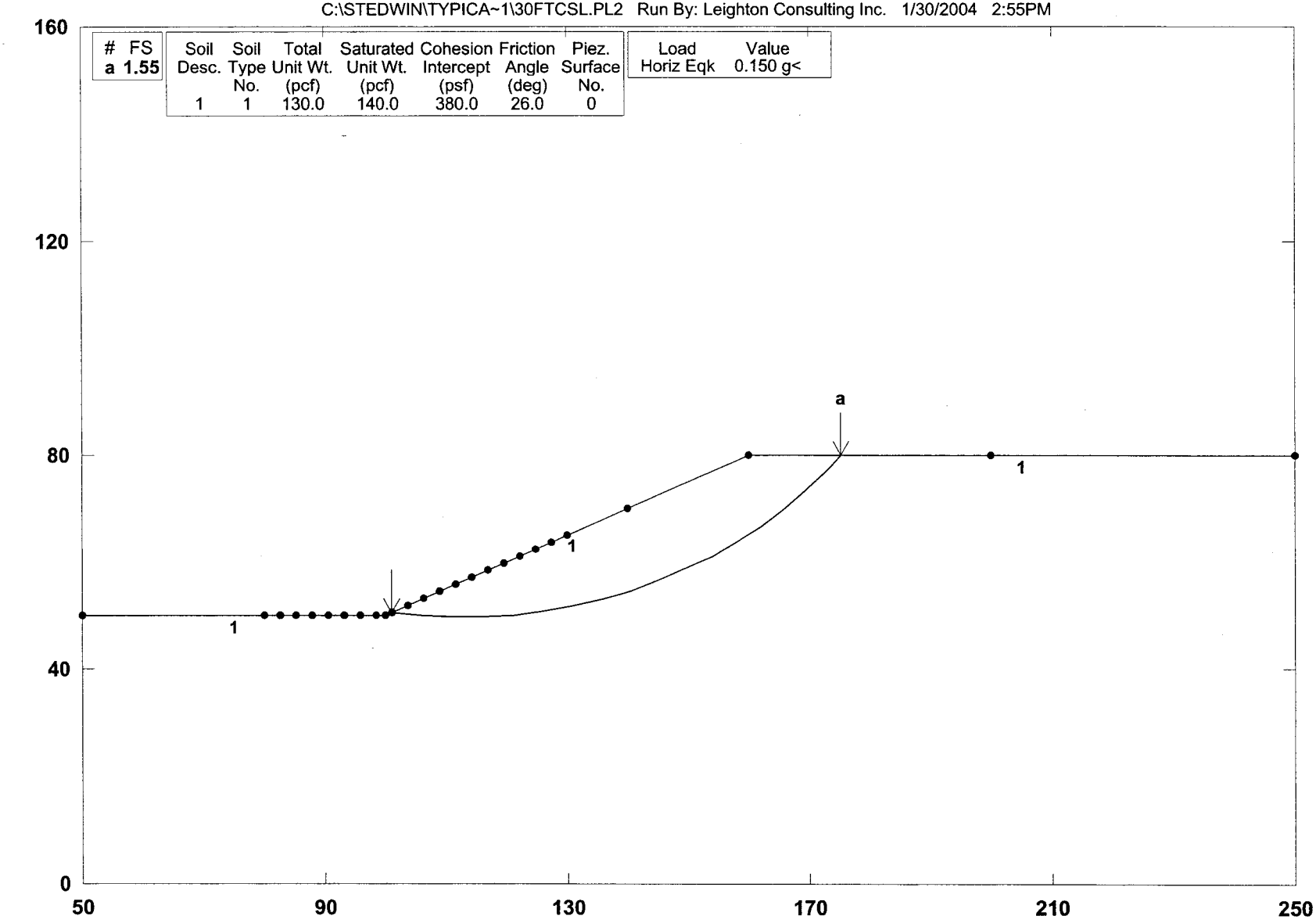
GSTABL7 v.2 FSmin=2.15

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

Woodside/ Evans & Earbani 110712-002 30 ft fill slope

C:\STEDWIN\TYPICA~1\30FTCSL.PL2 Run By: Leighton Consulting Inc. 1/30/2004 2:55PM

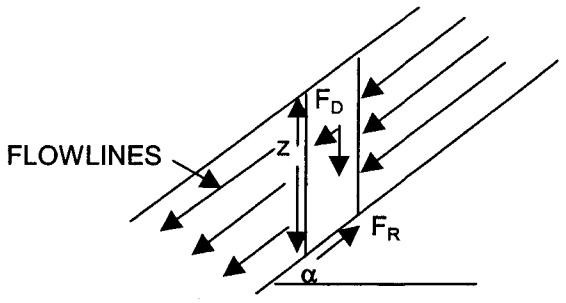


GSTABL7 v.2 FSmin=1.55

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

SURFICIAL SLOPE STABILITY ANALYSIS



Project No.: 110712-002
Project: Woodside/Evans & Garbanit
Case: 2:1 Fill Slope

Depth of Saturation (ft), Z	=	**4**
Buoyant Unit Weight of Soil (pcf), γ_b	=	**72.6**
Total Unit Weight of Soil (pcf), γ_t	=	**135**
Slope Angle, α	=	**26.6**
Angle of Internal Friction, ϕ	=	**26**
Cohesion (psf), c	=	**380**

Force Tending To Cause Movement:

$$F_D = Z\gamma_t \sin 2\alpha / 2 = \mathbf{216.20}\ \text{lb/ft}$$

Force Tending To Resist Movement:

$$F_R = Z\gamma_b \cos^2 \alpha \tan \phi + (c) = \mathbf{493.24}\ \text{lb/ft}$$

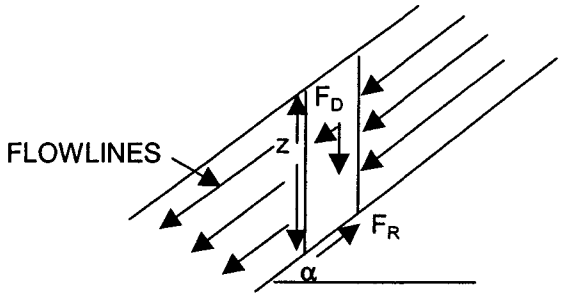
F.S.:

$$\frac{2Z\gamma_b \cos^2 \alpha \tan \phi + 2c}{Z\gamma_t \sin 2\alpha}$$

F.S. = 2.3

SURFICIAL STABILITY	Project Name : Woodside/Evans & Garbani Project Number : 110712-002 Designed/Checked : AXT/AXT

SURFICIAL SLOPE STABILITY ANALYSIS



Project No.: 110712-002
Project: Woodside/Evans & Garbanit
Case: 2:1 Cut Slope

Depth of Saturation (ft), Z	=	**4**
Buoyant Unit Weight of Soil (pcf), γ_b	=	**77.6**
Total Unit Weight of Soil (pcf), γ_t	=	**140**
Slope Angle, α	=	**26.6**
Angle of Internal Friction, ϕ	=	**37**
Cohesion (psf), c	=	**400**

Force Tending To Cause Movement:

$$F_D = Z\gamma_t \sin 2\alpha / 2 = \mathbf{224.20}\ \text{lb/ft}$$

Force Tending To Resist Movement:

$$F_R = Z\gamma_b \cos^2 \alpha \tan \phi + (c) = \mathbf{587.01}\ \text{lb/ft}$$

F.S.:

$$\frac{2Z\gamma_b \cos^2 \alpha \tan \phi + 2c}{Z\gamma_t \sin 2\alpha}$$

F.S. = 2.6

SURFICIAL STABILITY	Project Name : Woodside/Evans & Garbani Project Number : 110712-002 Designed/Checked : AXT/AXT

Appendix F

LEIGHTON AND ASSOCIATES, INC

GENERAL EARTHWORK AND GRADING SPECIFICATIONS FOR ROUGH GRADING

1.0 General

1.1 Intent: These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

1.2 The Geotechnical Consultant of Record: Prior to commencement of work, the owner shall employ the Geotechnical Consultant of Record (Geotechnical Consultant). The Geotechnical Consultants shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include natural ground after it has been cleared for receiving fill but before fill is placed, bottoms of all "remedial removal" areas, all key bottoms, and benches made on sloping ground to receive fill.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to determine the attained level of compaction. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

1.3 The Earthwork Contractor: The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the plans and specifications. The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" of

work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified.

2.0 Preparation of Areas to be Filled

2.1 Clearing and Grubbing: Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 5 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed.

2.2 Processing: Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free of large clay lumps or clods and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction.

2.3 Overexcavation: In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.4 Benching: Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), the ground shall be stepped or benched. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.

2.5 Evaluation/Acceptance of Fill Areas: All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

3.0 Fill Material

3.1 General: Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

3.2 Oversize: Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

3.3 Import: If importing of fill material is required for grading, proposed import material shall

meet the requirements of Section 3.1. The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed.

4.0 Fill Placement and Compaction

4.1 Fill Layers: Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 Fill Moisture Conditioning: Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557-91).

4.3 Compaction of Fill: After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557-91). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

4.4 Compaction of Fill Slopes: In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557-91.

4.5 Compaction Testing: Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

4.6 Frequency of Compaction Testing: Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 Compaction Test Locations: The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfills

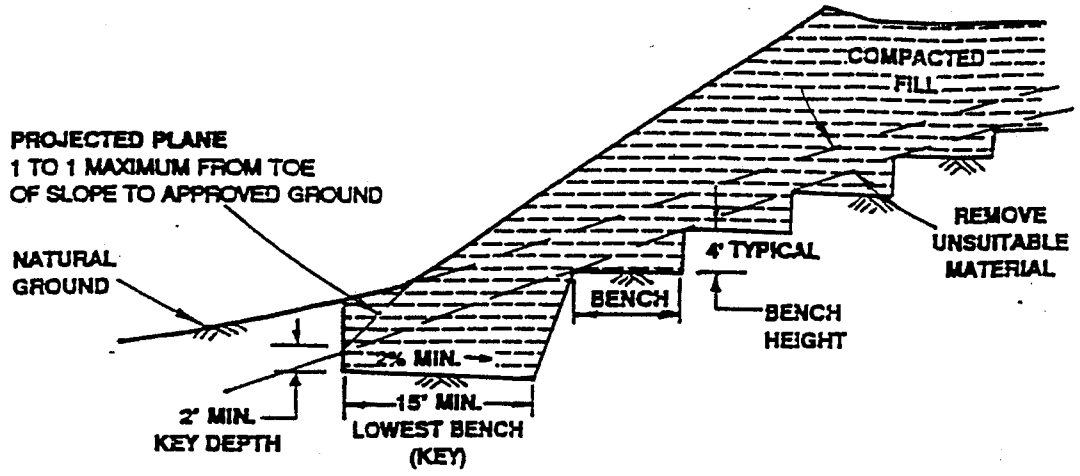
7.1 The Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.

7.2 All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 90 percent of maximum from 1 foot above the top of the conduit to the surface.

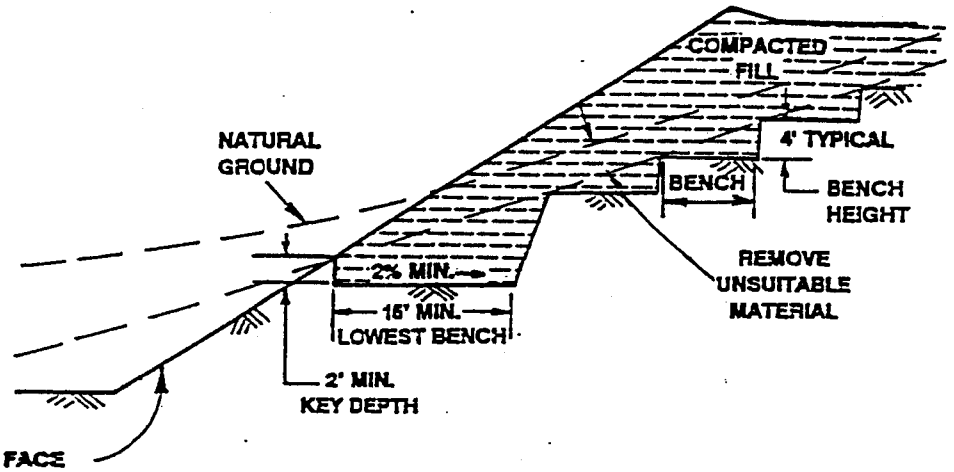
7.3 The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

7.4 The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.

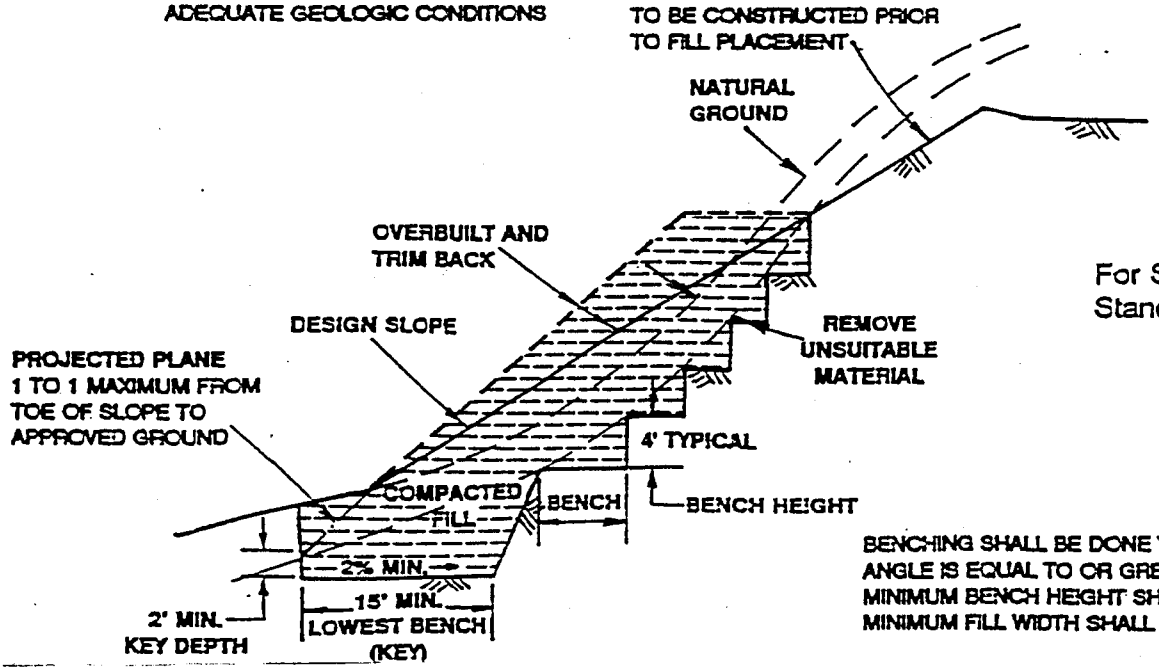
7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.



FILL SLOPE



FILL-OVER-CUT SLOPE



CUT-OVER-FILL SLOPE

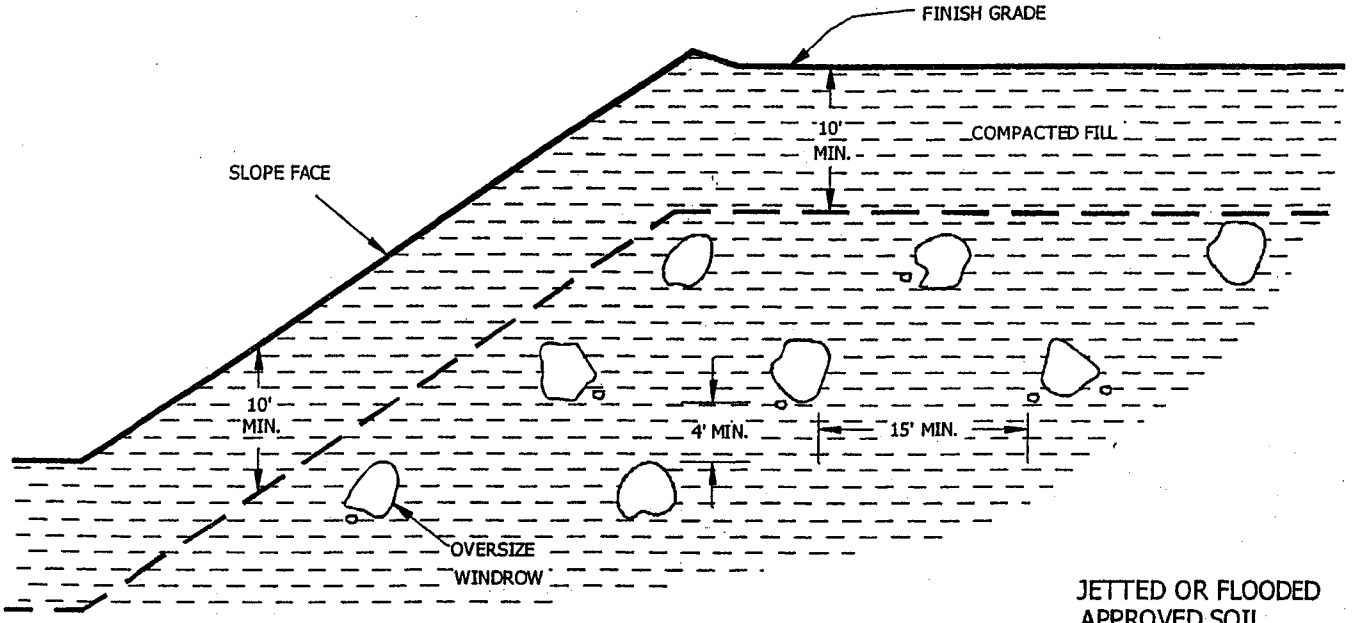
For Subdrains See Standard Detail C

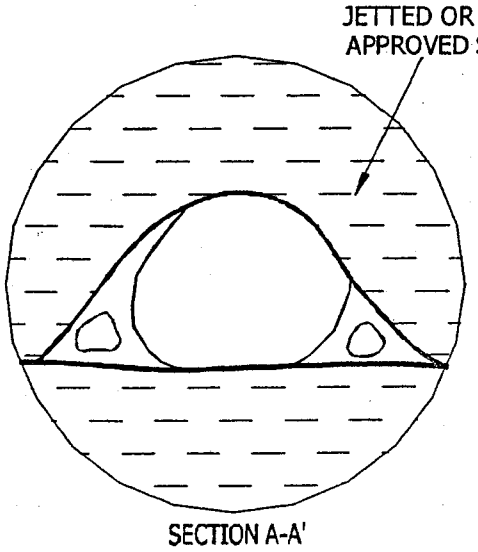
BENCHING SHALL BE DONE WHEN SLOPES
ANGLE IS EQUAL TO OR GREATER THAN 5:1
MINIMUM BENCH HEIGHT SHALL BE 4 FEET
MINIMUM FILL WIDTH SHALL BE 9 FEET

KEYING AND BENCHING

GENERAL EARTHWORK AND GRADING SPECIFICATIONS
STANDARD DETAILS A

Rev. 7/00

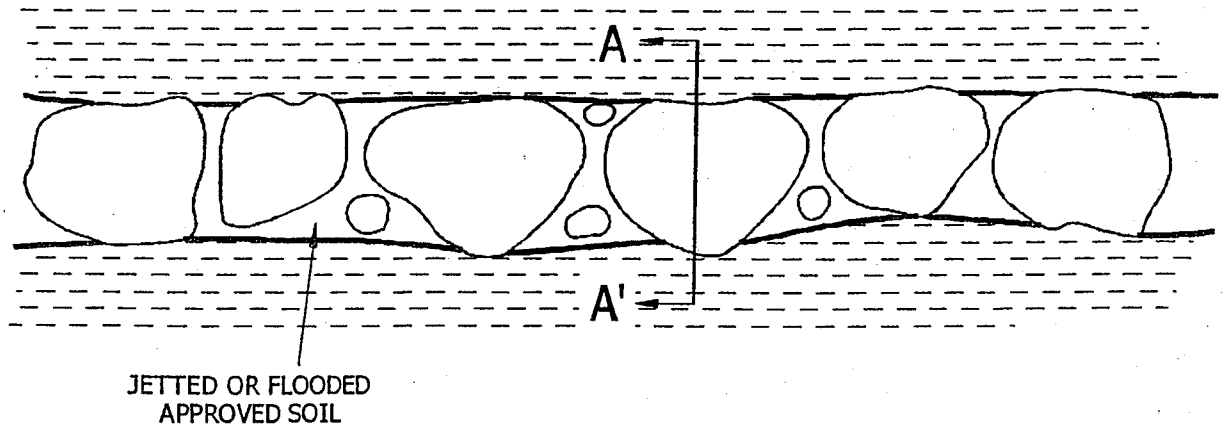




SECTION A-A'

- Oversize rock is larger than 8 inches in largest dimension.
- Backfill with approved soil jetted or flooded in place to fill all the voids.
- Do not bury rock within 10 feet of finish grade.
- Windrow of buried rock shall be parallel to the finished slope face.

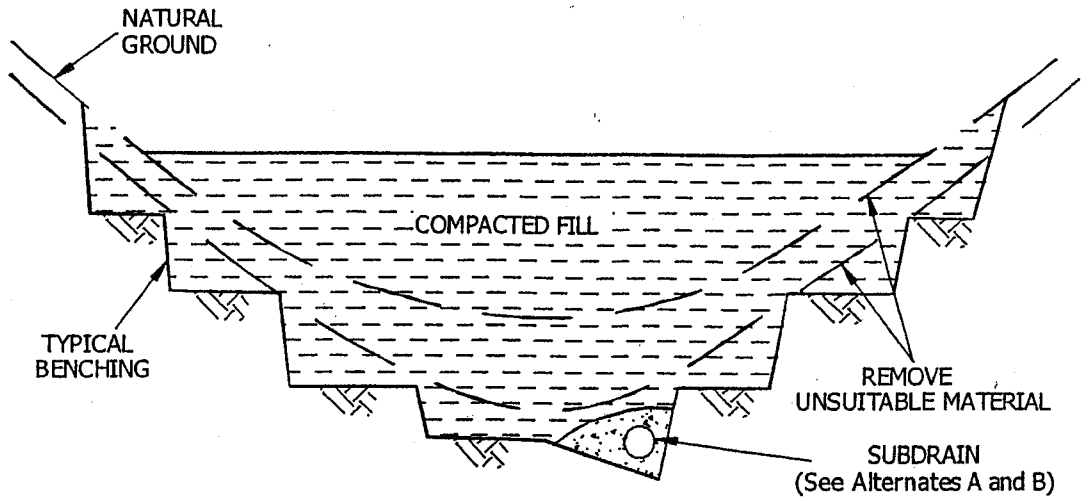
PROFILE ALONG WINDROW



OVERSIZE ROCK DISPOSAL

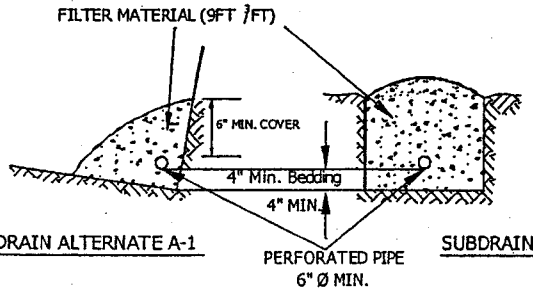
GENERAL EARTHWORK AND GRADING SPECIFICATIONS
STANDARD DETAILS B

Rev. 7/00



SUBDRAIN ALTERNATE A

PERFORATED PIPE SURROUNDED WITH FILTER MATERIAL

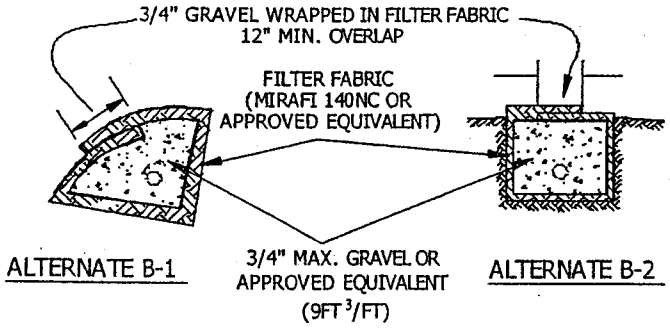


FILTER MATERIAL

FILTER MATERIAL SHALL BE CLASS 2 PERMEABLE MATERIAL PER STATE OF CALIFORNIA STANDARD SPECIFICATION, OR APPROVED ALTERNATE. CLASS 2 GRADING AS FOLLOWS:

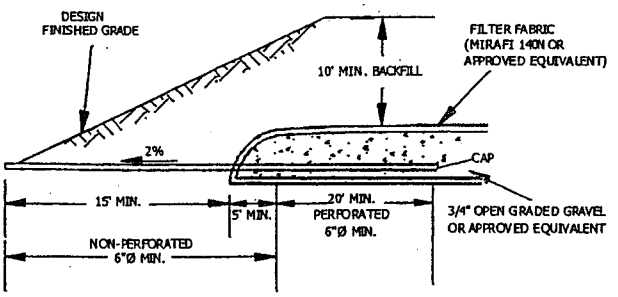
Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

SUBDRAIN ALTERNATE B

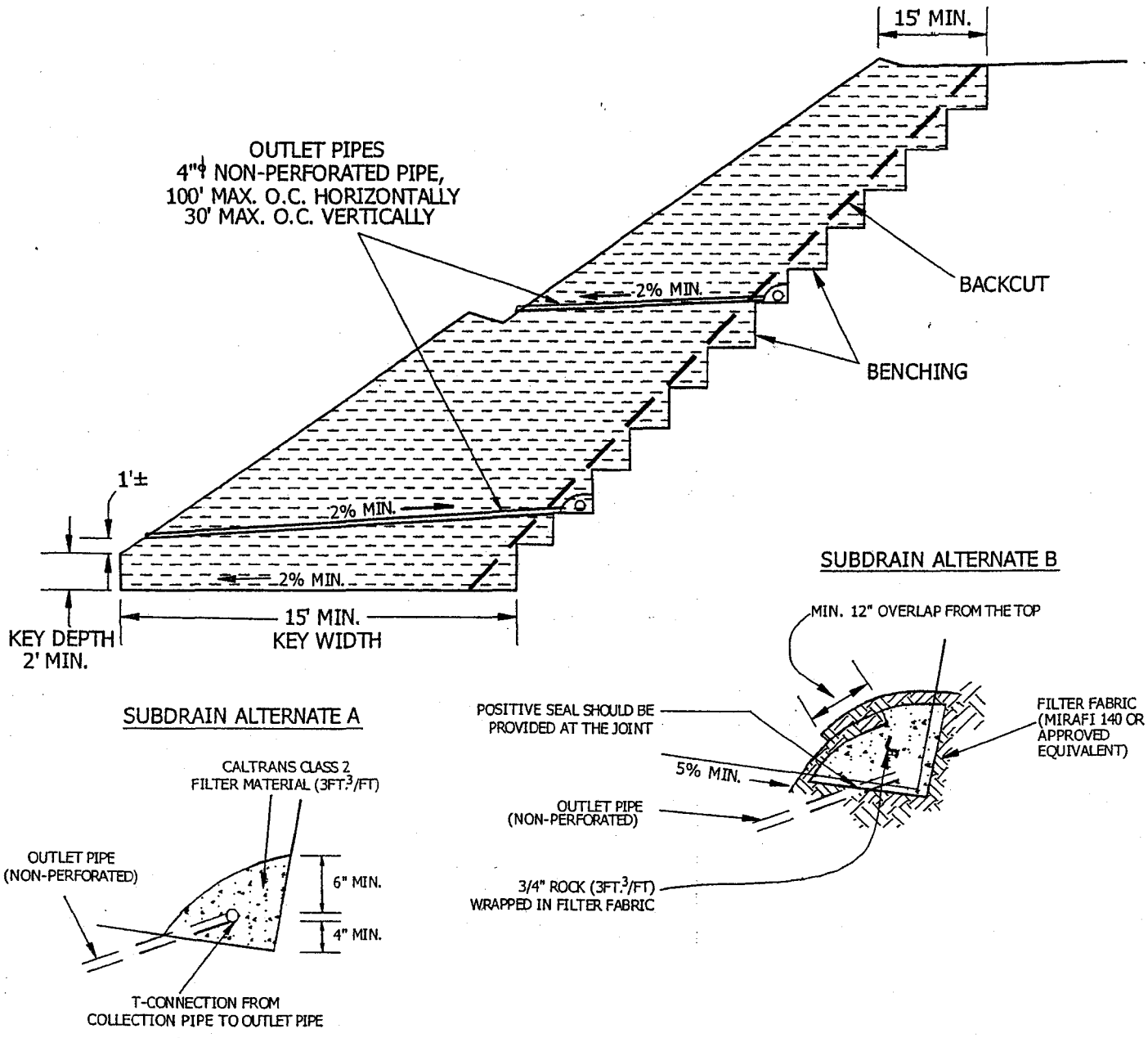


○ PERFORATED PIPE IS OPTIONAL PER GOVERNING AGENCY'S REQUIREMENTS

DETAIL OF CANYON SUBDRAIN TERMINAL



CANYON SUBDRAIN	GENERAL EARTHWORK AND GRADING SPECIFICATIONS STANDARD DETAILS C	Rev. 7/00



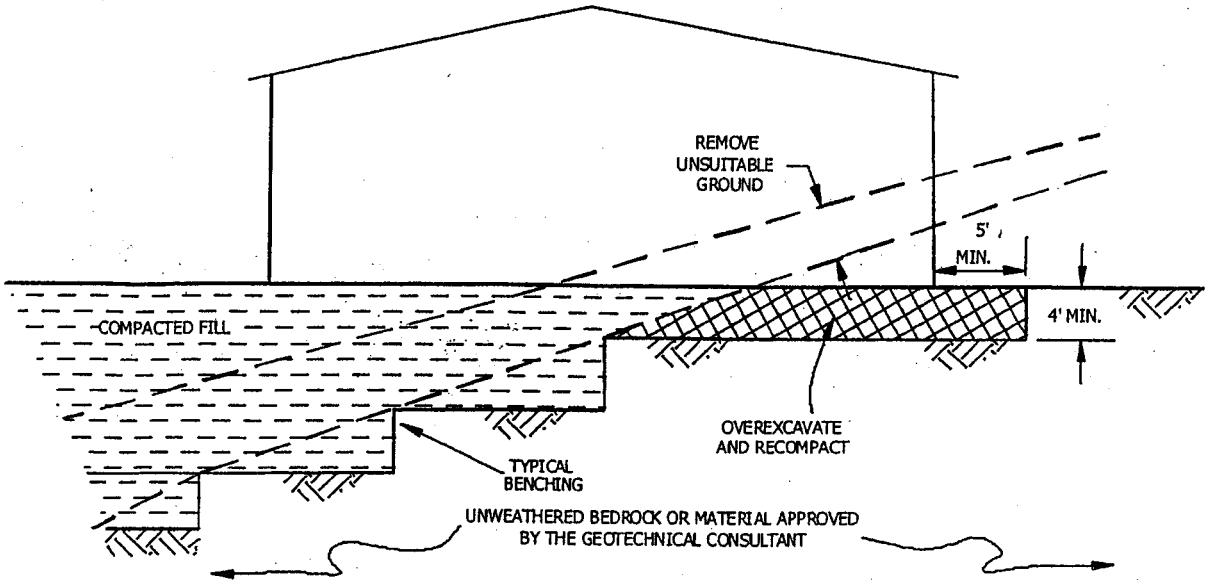
SUBDRAIN ALTERNATE A

SUBDRAIN ALTERNATE B

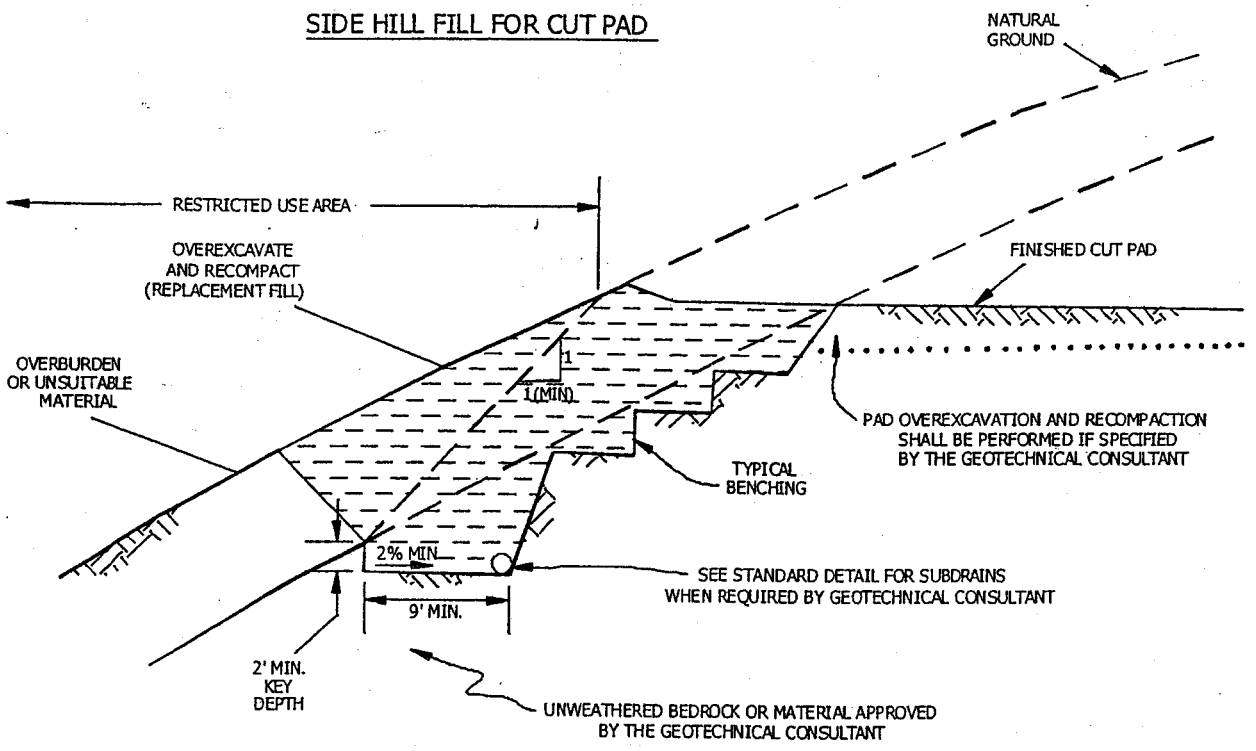
- SUBDRAIN INSTALLATION - Subdrain collector pipe shall be installed with perforations down or, unless otherwise designated by the geotechnical consultant. Outlet pipes shall be non-perforated pipe. The subdrain pipe shall have at least 8 perforations uniformly spaced per foot. Perforation shall be 1/4" to 1/2" if drilled holes are used. All subdrain pipes shall have a gradient at least 2% towards the outlet.
- SUBDRAIN PIPE - Subdrain pipe shall be ASTM D2751, ASTM D1527 (Schedule 40) or SDR 23.5 ABS pipe or ASTM D3034 (Schedule 40) or SDR 23.5 PVC pipe.
- All outlet pipe shall be placed in a trench and, after fill is placed above it, rodded to verify integrity.

BUTTRESS OR REPLACEMENT FILL SUBDRAINS	GENERAL EARTHWORK AND GRADING SPECIFICATIONS STANDARD DETAILS D	Rev. 7/00

CUT-FILL TRANSITION LOT OVEREXCAVATION



SIDE HILL FILL FOR CUT PAD



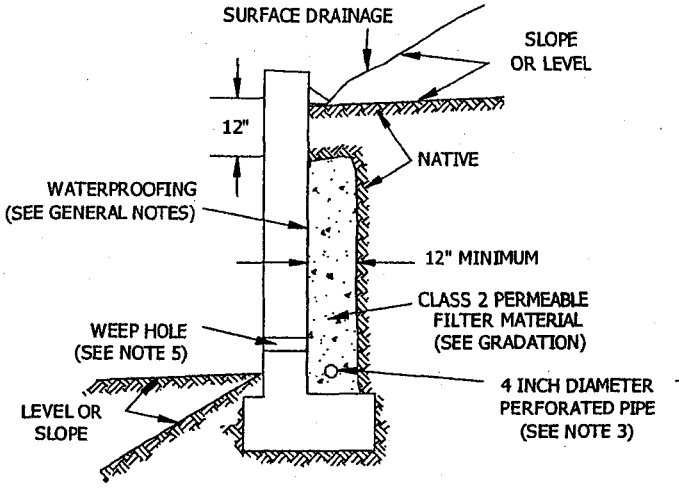
TRANSITION LOT FILLS AND SIDE HILL FILLS

GENERAL EARTHWORK AND GRADING
SPECIFICATIONS
STANDARD DETAILS E

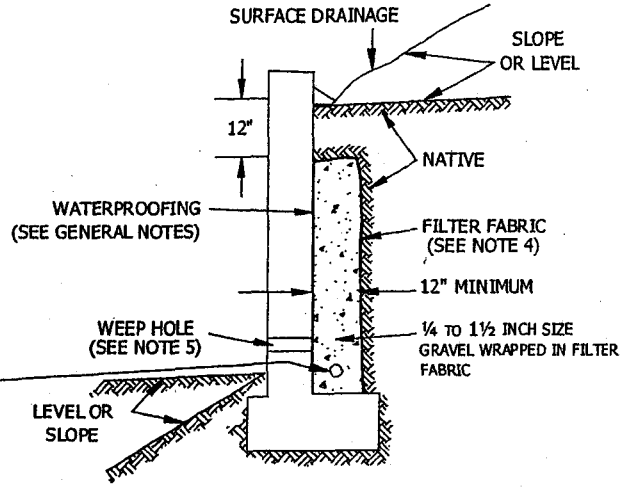
Rev. 7/00

SUBDRAIN OPTIONS AND BACKFILL WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF ≤50

OPTION 1: PIPE SURROUNDED WITH CLASS 2 PERMEABLE MATERIAL



OPTION 2: GRAVEL WRAPPED IN FILTER FABRIC



Class 2 Filter Permeable Material Gradation
Per Caltrans Specifications

Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

GENERAL NOTES:

* Waterproofing should be provided where moisture nuisance problem through the wall is undesirable.
* Water proofing of the walls is not under purview of the geotechnical engineer
* All drains should have a gradient of 1 percent minimum
*Outlet portion of the subdrain should have a 4-inch diameter solid pipe discharged into a suitable disposal area designed by the project engineer. The subdrain pipe should be accessible for maintenance (rodding)
*Other subdrain backfill options are subject to the review by the geotechnical engineer and modification of design parameters.

Notes:

1) Sand should have a sand equivalent of 30 or greater and may be densified by water jetting.
2) 1 Cu. ft. per ft. of 1/4- to 1 1/2-inch size gravel wrapped in filter fabric
3) Pipe type should be ASTM D1527 Acrylonitrile Butadiene Styrene (ABS) SDR35 or ASTM D1785 Polyvinyl Chloride plastic (PVC), Schedule 40, Armco A2000 PVC, or approved equivalent. Pipe should be installed with perforations down. Perforations should be 3/8 inch in diameter placed at the ends of a 120-degree arc in two rows at 3-inch on center (staggered)
4) Filter fabric should be Mirafi 140NC or approved equivalent.
5) Weephole should be 3-inch minimum diameter and provided at 10-foot maximum intervals. If exposure is permitted, weepholes should be located 12 inches above finished grade. If exposure is not permitted such as for a wall adjacent to a sidewalk/curb, a pipe under the sidewalk to be discharged through the curb face or equivalent should be provided. For a basement-type wall, a proper subdrain outlet system should be provided.
6) Retaining wall plans should be reviewed and approved by the geotechnical engineer.
7) Walls over six feet in height are subject to a special review by the geotechnical engineer and modifications to the above requirements.

RETAINING WALL BACKFILL AND SUBDRAIN DETAIL FOR WALLS 6 FEET OR LESS IN HEIGHT

WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF ≤50

Rev. 7/00

Figure No. _____

Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

TRANSMITTAL

To: Woodside Homes of California
23121 Antonio Parkway, Suite 120
Rancho Santa Margarita, California 92688

Date: January 30, 2004

Project No. 110712-002

Attention: Mr. Peter Evans

Transmitted:	The Following:	For:
_X_ Herewith	___ Draft Report	___ Your Use
___ Via Courier	_X_ Final Report	_X_ As Requested
___ Client Pick Up	___ Extra Report	
___ Fed Ex	___ Proposal	
___ Other		

Subject: Geotechnical Review of Rough Grading Plans, Tract 31194, Menifee, County of Riverside, California.

LEIGHTON AND ASSOCIATES, INC.

By: Scot Mathis

Distribution: (3) Addressee
(3) Hunsaker & Associates; Attention: Mr. Doug Snyder

41715 Enterprise Circle N., Suite 103 ▪ Temecula, CA 92590-5661
909.296.0530 ▪ Fax 909.296.0534 ▪ www.leightongeo.com

Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

July 1, 2021

Project No. 11813.003

Richland Communities Inc.
4100 Newport Place Drive
Newport Beach, CA 92672

Attention: Mr. Brian Hardy, VP – Land Development

Subject: Geotechnical Plan Review / Addendum
Golden Meadows, Tract 31194, Phase IV (PLN21-0199)
Menifee, California

In accordance with your request and authorization, we are pleased to present this addendum report providing geotechnical plan review and updated seismic coefficients for the subject project. This report also discusses current site conditions as observed during our recent geologic reconnaissance and confirms our previous findings and recommendations.

PURPOSE AND SCOPE OF WORK

As indicated above, this addendum report is to provide a plan review and updated seismic coefficients per the 2019 California Building Code (CBC). More specifically, the scope of our work included the following:

- Review of available site-specific geologic information, including our 2004 geotechnical report performed for this site.
- Preparation of this addendum/plan review report confirming our findings and providing updated recommendations pertaining to the proposed residential development.

SITE AND PROJECT DESCRIPTION

The proposed residential development (overall Tract 31194) is located southeast of Evans Road and Garbani Road in the City of Menifee, California (see Figure 1). Based on our recent site visit, the subject property is in generally the same geologic conditions as those described in our previous report (Leighton, 2004). The proposed Phase IV development (subject of this review/addendum) generally constitutes the eastern portion of the overall site (Tract 31194) and encompasses approximately 43.7 acres. Based on provided site conceptual plan (Figure 2), Phase IV will be developed into 262 homesites

with associated streets, utilities, a retention basin, and a park site. In addition, 2:1 cut slopes up to a height of 110-feet are proposed along the northern/eastern site boundaries.

SUMMARY OF CONCLUSIONS & RECOMMENDATIONS

Based on our review of the provided conceptual grading plan (Figure 2), we confirm herewith that our recommendations contained in the referenced report (Leighton, 2004) remain valid except as superseded below.

General Earthwork Considerations

Due to anticipated shallow rock conditions and proposed site grading, deep excavations on this site are expected to require heavy ripping, blasting or other rock reduction techniques and will likely generate oversize rock materials (rock fragments greater than 12 inches). Based on County standards, oversize rock should not be placed in the upper ten (10) feet below finish pad grades.

2019 CBC Seismic Coefficients

The 2019 CBC site-specific seismic coefficients provided in table below are based on an interactive tools/programs currently available on USGS website and OSHPD seismic maps. These seismic coefficients were based on Site Class C since this site is generally underlain by relatively shallow bedrock.

Site Seismic Coefficients / Coordinates	Site
Latitude	33.65155
Longitude	-117.18727
Site Class	**C**
Spectral Response (short), S_S	1.41g
Spectral Response (1 sec), S_1	0.52g
Site Modified Peak Ground Acceleration, PGA_M	0.72
Short Period Site Coefficient at 0.2s Period, Fa	*1.20*
Long Period Site Coefficient at 1s Period, Fv	*1.48*
Max. Considered Earthquake Spectral Response Acceleration (short), S_{MS}	1.69g
Max. Considered Earthquake Spectral Response Acceleration – (1 sec), S_{M1}	0.77g
5% Damped Design Spectral Response Acceleration (short), S_{DS}	**1.12g**
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	**0.51g**
Site-Specific Peak Ground Acceleration, PGA	0.60

g = Gravity Acceleration

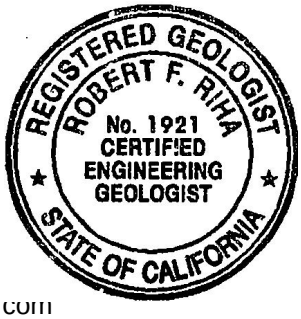
C L O S U R E

We appreciate the opportunity to work with you on this project. If you have any questions regarding this report, please call us at your convenience at **(866) *LEIGHTON***, direct at the phone extensions or e-mail addresses listed below.

Respectfully submitted,

LEIGHTON AND ASSOCIATES, INC.

Simon I. Saiid, GE 2641
Principal Engineer
Ext. 8013; ssaiid@leightongroup.com



Robert F. Riha, CEG 1921
Senior Principal Geologist
Ext. 8914; rriha@leightongroup.com

Attachment: References
Figure 1 – Site Location Concept Plan
Figure 2 – Proposed Phase IV Concept Plan

Distribution: (1) addressee (pdf via email)

References

Leighton and Associates, Inc., 2004a, Geotechnical Review of Rough Grading Plans, Tract 31194, Menifee, County of Riverside, California, PN. 110712-002, dated January 30.

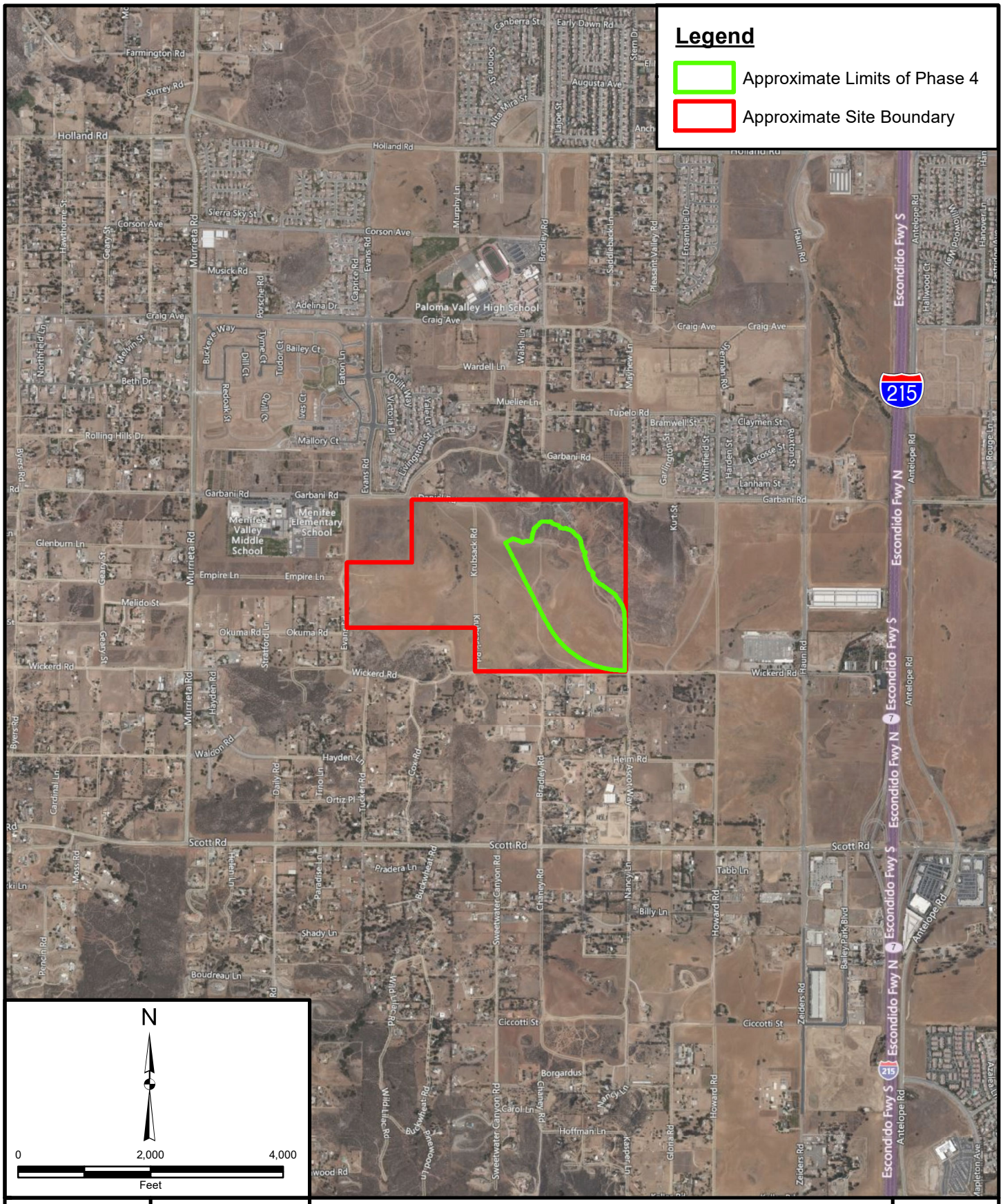
Leighton and Associates, Inc., 2004b, Geotechnical Review Update, Tentative Tract No. 31194, Menifee Area, County of Riverside, California, PN. 110712.004, dated November 2.

Leighton and Associates, Inc., 2017, Results of Onsite Percolation/Infiltration Testing, Proposed Storm Water Infiltration Basins, Golden Meadows, Tract 31194-1, -2, &-3, City of Menifee, Riverside County, California, PN 11813.001, dated October 9.

Leighton and Associates, Inc., 2021, Geotechnical Exploration, Proposed Water Tank, Golden Meadows – Tract 31194, Menifee Area, Riverside County, California, PN 11813.002, dated April 7.

OSHPD, 2021, Seismic Design Maps, an interactive computer program on OSHPD website to calculate Seismic Response and Design Parameters based on ASCE 7-16 seismic procedures, https://seismicmaps.org/.

The Galloway Group, 2021, Conceptual Site Plan, Golden Meadows, dated March 16, 2021.



Project: 11813.003	Eng/Geol: SIS/RFR
Scale: 1 " = 2,000 '	Date: July 2021
Base Map: ESRI ArcGIS Online 2021 Author: Leighton Geomatics (mmurphy)	

SITE LOCATION MAP

Plan Review / Addendum Report
Golden Meadows – Overall Tract 31194
Menifee, California

Figure 1

Leighton

Map Saved as V:\Drafting\11813\003\Maps\11813-003_F01_SLM_2021-07-01.mxd on 7/1/2021 12:26:32 PM

Project: 11813.003	Eng/Geol: SIS/RFR
Scale: 1 " = 300 '	Date: July 2021

Base Map: Conceptual Site Plan by The Galloway Group, dated 3/16/2021.

Author: Leighton Geomatics (mmurphy)

SITE CONCEPT PLAN

Plan Review / Addendum Report
Golden Meadows Phase IV (PLN21-0199)
East Portion of Tract 31194
Menifee, California

Figure 2

Leighton

Map Saved as V:\Drafting\11813\003\Maps\11813-003_F02_SP_2021-07-01.mxd on 7/1/2021 12:35:53 PM

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Appendix H. Phase I Environmental Site Assessment

HILLMANN
CONSULTING

PHASE I ENVIRONMENTAL SITE ASSESSMENT

Golden Meadows - Tract 31174
NW Corner of Wickerd Road and Ascot Way
Menifee, California 92868

Prepared For:

Richland Communities
3161 Michelson Drive, Suite 425
Irvine, CA 92612

August 9, 2021

Hillmann Project Number C3-8557

Your Property. Our Priority.
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www.HillmannConsulting.com

HILLMANN
CONSULTING

August 9, 2021

Mr. Brian Hardy
Richland Communities
3161 Michelson Drive, Suite 425
Irvine, CA 92612

RE: Phase I Environmental Site Assessment
Golden Meadows
NW Corner of Wickerd Road and Ascot Way
Menifee, California 92868
Hillmann Project No: C3-8557

Dear Mr. Hardy:

Hillmann Consulting LLC is pleased to provide the results of our Phase I Environmental Site Assessment of the above referenced property. This assessment was performed in general accordance with the scope and limitations of ASTM Practice E1527-13, which is the latest version of the E1527 standard published by the ASTM.

We appreciate the opportunity to provide environmental due diligence services. If you have any questions concerning this report, or if we can assist you in any other matter, please contact our office at 714-634-9500.

Sincerely,

Hillmann Consulting, LLC

Shilpa Sunil
Senior Project Manager

Ryan Terwilliger
Western Regional Manager

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List of Abbreviations/Acronyms

Hillmann may use the following abbreviations and acronyms for common terminology described in our report. Not all abbreviations or acronyms may be applicable to this report:

ACM	– Asbestos Containing Material
AOC	– Area of Concern
AST	– Aboveground Storage Tank
ASTM	– American Society for Testing Materials
BER	– Business Environmental Risk
CEA	– Classification Exception Area
CERCLA	– Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	– Comprehensive Environmental Response Compensation and Liability Information System
CESQG	– Conditionally Exempt Small Quantity Generator
COC	– Chemicals of Concern
CORRACTS	– Corrective Action Sites
CREC	– Controlled Recognized Environmental Condition
DNPL	– Delisted National Priority List
DTSC	– Department of Toxic Substances Control
ENG	– Engineering
ERNS	– Emergency Response Notification System
FDEP	– Florida Department of Environmental Protection
FDNY	– Fire Department, City of New York
FDOT	– Florida Department of Transportation
FOI/FOIA/FOIL	– Freedom of Information / Freedom of Information Act / Freedom of Information Letter
HVAC	– Heating Ventilation & Air Conditioning
HREC	– Historic Recognized Environmental Condition
IAQ	– Indoor Air Quality
ISRA	– Industrial Site Recovery Act
LBP	– Lead-Based Paint
LQG	– Large Quantity Generator
LTANK	– Leaking Storage Tank
LUST	– Leaking Underground Storage Tank
MassDEP	– Massachusetts Department of Environmental Protection
SDS/MSDS	– Safety Data Sheet / Material Safety Data Sheet
NA	– Not Applicable
NCDOH	– Nassau County Department of Health
NFA	– No Further Action
NFRAP	– No Further Remedial Actions Planned
NJDEP	– New Jersey Department of Environmental Protection
NPDES	– National Pollutant Discharge Elimination System
NPL	– National Priority List
NYCDEP	– New York City Department of Environmental Protection
NYCDOB	– New York City Department of Buildings
NYCOER	– New York City Office of Environmental Remediation
NYSDEC	– New York State Department of Environmental Conservation
OPRA	– Open Public Records Act
PADEP	– Pennsylvania Department of Environmental Protection
PAH	– Polycyclic Aromatic Hydrocarbon
PCE	– Perchloroethylene
RAO	– Response Action Outcome
RCRA	– Resource Conservation and Recovery Act
RCRIS	– Resource Conservation and Recovery Information System
REC	– Recognized Environmental Condition
RWQCB	– Regional Water Quality Control Board
SCAQMD	– South Coast Air Quality Management District
SCDHS	– Suffolk County Department of Health Services
SDG	– Significant Data Gap
SEMS	– Superfund Enterprise Management System
SRP	– Site Remediation Program
SQG	– Small Quantity Generator
SVOC	– Semi-Volatile Organic Compound
TCE	– Trichloroethylene
TSDF	– Treatment Storage and/or Disposal Facility
USEPA	– United States Environmental Protection Agency
UST	– Underground Storage Tank
VEC	– Vapor Encroachment Condition
VOC	– Volatile Organic Compound

1.0 FINDINGS, OPINIONS, AND CONCLUSIONS

Hillmann Consulting, LLC (Hillmann) performed a Phase I Environmental Site Assessment (ESA) of NW Corner of Wickerd Road and Ascot Way, Menifee, California (the Property). The assessment has been conducted in accordance with our contracted scope of work and the ASTM Standard Practice E 1527-13 for Phase I Environmental Site Assessments and All Appropriate Inquiries (AAI) Final Rule 40 CFR Part 312. This section contains a summary of findings, opinions and conclusions made by this assessment. However, this section, alone, does not constitute the complete assessment. The report must be read in its entirety.

1.1 Summary of Project Details

Primary Street Address:		NW Corner of Wickerd Road and Ascot Way			
City:	Menifee	**County:**	Riverside	**State:**	California
Tax ID/Parcel Number:		360-0300-002, -003, -004, -005, -006, -009, 360-350-001			
Property Owner:		Richland Meadowland/Hill County S A			
Zoning Designation:		R-5 360-300-003, R-4 360-300-002, R-1 360-300-004, -005, 006, -009, -001			
Approx. Property Area:		206.8 acres			
Buildings/# of Floors		NA			
Approx. Building Area:		NA			
Approx. Year Built:		NA			
Commercial Occupants:		NA			
Current Use:		Undeveloped land			
Prior Uses:		Undeveloped, agricultural			
Inspected By:		Ms. Shilpa Sunil			
Site Contact/Company:		Ms. Jessica Toohey/Richland Planned Communities			
Site Escort/Company:		Unescorted			
Inspection Date:		July 29, 2021			
Weather Conditions:		Fair, 60 degrees F			

1.2 Findings Summary Table

Assessment Subject	No REC	REC	CREC	HREC	Rpt. Ref.
Property Regulatory Records Review:	X				4.3
Property Historical Records Review:	X				4.2
Bulk Petroleum Storage:	X				5.3
On-Site Operations:	X				5.3
On-Site Haz-Mat Storage/Use/Spills:	X				5.3
Transformers/Hydraulic Systems:	X				5.3
Waste Discharges:	X				5.3
Interviews:	X				6.0
Adjoining & Nearby Properties:	X				4.3 5.2
Prior Env. Reports/User Provided Info:	X				3.0
Data Gaps:	X				2.3

1.3 Findings, Opinions and Conclusions

1.3.1 Recognized Environmental Conditions

Hillmann has performed a Phase I Environmental Site Assessment in accordance with the scope and limitations of ASTM Practice E1527-13 of the Property as described in Section 2 of this report. Any additions to, exceptions to, or deletions from this practice are also described in Section 2 of this report. This assessment has revealed no evidence of *recognized environmental conditions* in connection with the Property, except for the following:

RECOGNIZED ENVIRONMENTAL CONDITIONS	
	No RECs were identified.
HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITIONS	
	No HRECs were identified.
CONTROLLED RECOGNIZED ENVIRONMENTAL CONDITIONS	
	No CRECs were identified.
SIGNIFICANT DATA GAPS	
	No SDGs were identified.

1.3.2 REC Response Action Recommendations

The following table presents recommended response actions to the identified RECs for further investigation and/or corrective action:

REC RESPONSE ACTION SUMMARY TABLE	
REC	**Response Action**
	(None)

1.3.3 Notable Environmental Conditions / De Minimis Conditions

The following environmental conditions were identified, but are not considered to be a REC in connection with the Property:

NOTABLE ENVIRONMENTAL CONDITIONS / DE MINIMIS CONDITIONS	
1.	Prior to 1938 to at least 2002, the Property consisted largely of agricultural land with what appears to be a small development related to agricultural purposes on the west portion of the Property. Since at least 2005, the Property has been used as undeveloped land.
2.	Two water wells were observed at the southwestern portion of the Property. Hillmann recommends that prior to redevelopment; the water well should be properly abandoned under applicable local rules and regulations.

1.3.4 Environmental Professional Statement

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312. I have the specific qualifications based on education, training and experience to assess a *property* of the nature, history and setting of the subject *property*. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

_____

Ryan Terwilliger
Environmental Professional

1.4 Business Environmental Risks / Non-ASTM Scope

Hillmann has performed a limited review of the following potential Business Environmental Risks (BER), also known as "Non-ASTM Scope concerns", in accordance with the contracted scope of work scope for this assessment. The following is a summary of findings for applicable BERs. For a more detailed discussion of the findings and contracted scope of work, please see the referenced report section.

BUSINESS ENVIRONMENTAL RISKS / NON-ASTM SCOPE			
Subject	**Findings**	**Not Appl.**	**Rpt. Ref.**
Asbestos		X	7.1
Lead Paint		X	7.2
Radon	Property is located in the USEPA radon designation Zone 2 or 'moderate risk' area for radon.		7.3
Mold / Microbial Damage		X	7.4
NWI Wetlands	No mapped wetland areas were depicted at the Property.		7.5
Lead in Drinking Water		X	7.6

2.0 INTRODUCTION

2.1 Purpose and Scope

This assessment was conducted utilizing generally accepted Phase I ESA industry standards in accordance with the ASTM Standard Practice E1527-13. The ASTM describes these methodologies as representing good commercial and customary practice in the United States of America for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products. As such, this practice is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner or bona fide prospective purchaser limitations on CERCLA liability (hereinafter, the "landowner liability protections," or "LLPs"): that is, the practice that constitutes all appropriate inquiries into the previous ownership and uses the property consistent with good commercial and customary practice as defined at 42 U.S.C. §9601(35) (B). The primary goal of the processes established by ASTM E1527-13 is to identify *recognized environmental conditions* in connection with the Property.

The term *recognized environmental condition (REC)* is defined by the ASTM as the presence or likely presence of any hazardous substances or petroleum products in, on or at a property: (1) due to a release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.

The ASTM has also defined the terms *historical recognized environmental conditions* and *controlled recognized environmental conditions* as two additional types of RECs. The term *historical recognized environmental condition (HREC)* is defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the Property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the Property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls or engineering controls).

The term *controlled recognized environmental condition (CREC)* is defined as a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.

Conditions determined to be *"de minimis conditions"* are not considered to be RECs, HRECs or CRECs. *De minimis condition* is defined by the ASTM, "…as a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies."

The chief components of this assessment are generally described as follows:

- A non-invasive visual reconnaissance of the Property and adjoining properties in accordance with ASTM guidelines for evidence of RECs.

- Interviews of past and present owners and occupants and state and local government officials, seeking information related to the potential presence of RECs at the Property.

- A review of standard physical record sources for available topographic, geologic and groundwater data.

- A review of standard historic record sources, such as fire insurance maps, city directories, aerial photographs, prior reports and interviews, etc., to determine prior uses of the Property from the present, back to the Property's first developed use, or back to 1940, whichever is earlier.

- A review of standard environmental record sources including federal and state environmental databases, and additional environmental record sources, to identify potential regulatory concerns with the Property, adjoining properties and properties located within the surrounding area.

An evaluation of environmental or other regulatory compliance matters is excluded from the scope of this assessment.

These methodologies are described as representing good commercial and customary practice for conducting an Environmental Site Assessment of a property for the purpose of identifying recognized environmental conditions.

2.1.1 Business Environmental Risks/Non-ASTM Scope Considerations

In accordance with our contract agreement, Hillmann may have addressed the following potential environmental subject matters that are outside of the requirements of the ASTM E1527-13 standard:

Asbestos-Containing Materials (ACM): A cursory non-intrusive visual screening for the presence of suspect ACM within the accessed areas of buildings built prior to 1990 on the Property. It is emphasized that this cursory non-intrusive visual screening does not constitute an asbestos survey/inspection of the premises. An asbestos survey/inspection should be sought by the report User(s) if more certainty is desired regarding ACM and potential asbestos hazards at the Property. Furthermore, a review of regulatory compliance matters pertaining to asbestos is excluded from the scope of work.

Lead-Based Paint (LBP): A cursory non-intrusive visual screening of the condition of painted surfaces in the accessed areas of residential buildings/units built prior to 1980 on the Property. It is emphasized that this cursory non-intrusive visual screening does not constitute a comprehensive survey for LBP or potential lead hazards. A comprehensive inspection should be sought by the report User(s) if more certainty is desired regarding LBP at the Property. Furthermore, a review of regulatory compliance matters pertaining to lead-based paint is excluded from the scope of work.

USEPA Designated Radon Potential: Review of general non-site specific data published by the USEPA regarding the Radon Zone classification for the area of the Property.

Mold/Microbial Damage: A cursory non-intrusive visual screening within the accessed areas of buildings on the Property for evidence of systemic microbial problems, including visible mold

growth, water damaged building materials or musty odors. It is emphasized that this cursory non-intrusive visual screening does not constitute a comprehensive survey for moisture/mold/microbial damage. A more comprehensive inspection should be sought by the report User(s) if more certainty is desired regarding the potential for moisture/mold/microbial damages at the Property.

NWI Wetlands: Review of US Fish and Wildlife Service National Wetland Inventory digitized data of mapped wetlands as presented in the attached EDR Radius Map plus Geocheck Report.

It is emphasized that, regardless of the wetlands data obtained via the EDR Geocheck-Physical Setting Source Addendum, a delineation of regulated wetlands by a qualified professional would be warranted to determine the presence or absence of regulated wetlands at the Property.

Lead in Drinking Water: Review of the potential for elevated levels of lead in the drinking water by determining the source of the drinking water supply and a review of available testing or compliance data reports.

2.2 Property Location/Legal Description

Property location and legal description details are described as follows:

Primary Street Address:	NW Corner of Wickerd Road and Ascot Way				
City:	Menifee	**County:**	Riverside	**State:**	California
Tax ID/Parcel Number:	360-0300-002, -003, -004, -005, -006, -009, 360-350-001				
Approx. Land Area:	206.8 acres				
Apprx. Latitude/Longitude:	North 33.652357 degrees/West 117.186516 degrees				
Additional Details (if appl.):	NA				
Property Owner:	Richland Meadowland/Hill County S A				
Zoning Designation:	R-5 360-300-003, R-4 360-300-002, R-1 360-300-004, -005, 006, -009, -001				

2.3 Data Gaps

A *data gap* is defined by the ASTM as a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. A data gap is only significant if other information and/or professional experience raises reasonable concerns involving the data gap and the ability to determine the presence or absence of recognized environmental conditions. The following table summarizes data gaps encountered during the assessment as well as a discussion of their significance.

Data Gap:	Significant (Yes/No)?	Discussion
Historical records data failure	No	The date and/or type of the first developed use of the Property was not documented.

		Record gaps exceeding five years were encountered; however, no significant site use changes are suspected during these intervals.
Response to agency records requests not received as of date of report.	No	Any additional information indicative of a REC will be forwarded upon receipt.

2.4 User Reliance

This report is for the exclusive use of the User(s) named on the front cover. No other party(ies) shall have any right to rely on the content of this report without first obtaining the consent of the original report User; and without obtaining written consent from Hillmann in the form of a letter of reliance or report recertification.

2.5 Significant Assumptions

The following significant assumptions are made:

- The site operations at the time of the site visit are assumed to reflect typical site conditions relative to potential environmental conditions and that no concealment of environmental conditions or releases by site owners or occupants has occurred. Likewise, it is assumed that no areas of the Property with potential environmental concerns or RECs were concealed or otherwise not reported, intentionally or unknowingly, by the Property owners/occupants and/or site escort at the time of the site visit.

- For the purpose of estimating the approximate direction of groundwater flow in the absence of site specific groundwater data, unless indicated otherwise, an assumption has been made that the gradient of groundwater flow follows the surface topography of the Property and immediate surrounding area.

2.6 General Limitations and Exceptions

2.6.1 Limitations

The report turnaround time specified by the contract agreement for this assessment may present a limitation to the availability of pertinent regulatory agency records. Such limitations, if encountered, are further specified in Section 4.4.

Significant limitations related to the condition or accessibility of the Property at the time of the site reconnaissance, if encountered, are reported in Section 5.1.

2.6.2 Other Exceptions or Deletions

No other exceptions or deletions from the ASTM Standard E1527-13 are reported.

2.6.3 Special Terms and Conditions

This Phase I Environmental Site Assessment has been prepared using reasonable efforts in each phase of its work to identify recognized environmental conditions associated with hazardous substances, wastes and petroleum products at the Property. Findings within this report are based on information collected from observations made on the day of the site reconnaissance and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, site development, redevelopment, or other construction purposes. No representation or warranty is made that the past or current operations at the Property are, or have been, in compliance with all applicable federal, state and local laws, regulations and codes.

Findings, conclusions and recommendations presented in this report are based on visual observations of the Property, interviews conducted, the records reviewed, information provided by the Client, and/or a review of readily available and supplied drawings and documents. Information obtained during the assessment, whether written, graphic or verbal, provided by the Property contact(s) or as shown on any documents reviewed or received from the Property contact, owner or agent, or government agency source; is assumed to be accurate except as specifically stated otherwise in this report. Independent verification of the accuracy or completeness of all information reviewed or received during the course of this assessment is not made and excluded from the scope of work for this assessment. No warranty or guarantee is made of the accuracy or completeness of information that was obtained from ostensibly knowledgeable individuals, regulatory agency representatives or other secondary sources.

Regardless of the findings stated in this report, Hillmann is not responsible for consequences or conditions arising from facts that were concealed, withheld or not fully disclosed at the time the assessment was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The regulatory research is designed to meet the requirements of ASTM Standard E1527-13. Hillmann can neither warrant nor guarantee the accuracy or completeness of the information obtained from the regulatory database report provider during the course of this assessment.

Subsurface conditions may differ from the conditions implied by the surface observations and can only be reliably evaluated through intrusive techniques.

Reasonable efforts have been made during this assessment to identify aboveground and underground storage tanks and ancillary equipment. Reasonable efforts are limited to information gained from visual observation of largely unobstructed areas, recorded database information held in public record and available information gathered from interviews. Such methods may not identify

surficial and subsurface features that may have been hidden from view due to parked automobiles and other vehicles, snow cover, vegetative growth, pavement, construction or debris pile storage or incorrect information from sources.

No guarantee, explicit or implied, is made that the records pertaining to historical ownership or occupancy which were reviewed represent a comprehensive or precise delineation of past Property ownership or tenancy for legal purposes.

The ASTM E1527-13 standard states that recommendations are not required to be included in a Phase I ESA report; however, further that recommendations are an additional service that may be useful in the User's analysis of landowner liability protections or business environmental risks; and that the User should consider whether recommendations for additional inquiries or other services are desired.

The recommended response actions to the identified RECs presented in Section 1.3, if any, are not intended to represent the only course(s) of action to take; nor does it imply any opinion as to the timing of the action. Furthermore, it is emphasized that additional response actions may become warranted depending on the outcome of the initial action(s) taken. Hillmann advises that consultation with legal counsel familiar with environmental and real estate law may be beneficial to the decision making process for the type and timing of a response action to identified RECs, if any.

Due to the limited nature of our review of potential Business Environmental Risks, the User of the report should consider whether to take additional action(s) to further define, properly manage and/or mitigate potential BERs.

In the event of any conflict between the terms and conditions of this report and the terms and conditions of the consulting services agreement for this project, the consulting services agreement shall control.

3.0 USER PROVIDED INFORMATION

The term "User" is defined by ASTM as the party seeking to use Practice E1527 to complete an environmental site assessment of the Property; specifically, the entities named on the front cover to which the report has been addressed.

3.1 Prior Environmental Reports/Documentation

The following prior environmental reports/documentation was provided:

Phase I Environmental Site Assessment – Golden Meadows, Menifee, California prepared by Hillmann Consulting, LLC and dated January 25, 2013. Below is a summary of the Phase I Environmental Site Assessment:

- Based on the historic usage of the Property for crop fields, historic applications of pesticides have likely occurred at the Property. Hillmann did not identify any documented storage or usage of pesticides at the time of the assessment. Notably, Hillmann did not identify any areas of bulk storage or mixing areas for pesticides at the time of the assessment.

- Based on the historical use of the Property as crop fields, if the Property is planned for redevelopment, additional investigation would be recommended to further assess whether elevated levels of pesticide compounds exist in the surface soils at the Property.

Phase I Environmental Site Assessment – Golden Meadows, Tract 31174, Menifee, California prepared by Hillmann Consulting, LLC and dated August 31, 2017. Any additions to, exceptions to, or deletions from this practice are also described in Section 2 of this report. The report indicated the following of the Phase I Environmental Site Assessment:

"A prior report from Hillmann identified the potential for elevated pesticide levels of the Property due to historic use as agricultural land and recommended further investigation. During this site visit of this assessment Hillmann collected twenty-four (24) soil samples and analyzed them for organochlorine pesticides (OCPs), Title 22 metals, and polycyclic aromatic hydrocarbons (PAHs). The sampling locations are shown on Figure 2. Site Diagram. The results were below the detection level for all OCPs and PAHs analyzed. Below is the summary of the OCP results:

Summary of Organo-Chlorine Pesticide Results (mg/Kg)

Sample ID	4,4 DDD	4,4 DDE	4,4 DDT	Other OCP (Endrin Aldehyde)	Other OCP (Endosulfan II)
B-1	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-2	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-3	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-4	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-5	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-6	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-7	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002

Sample ID	4,4 DDD	4,4 DDE	4,4 DDT	Other OCP (Endrin Aldehyde)	Other OCP (Endosulfan II)
B-8	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-9	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-10	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-11	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-12	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-13	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-14	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-15	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-16	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-17	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-18	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-19	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-20	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-21	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-22	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-23	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
B-24	ND<0.002	ND<0.002	ND<0.002	ND<0.002	ND<0.002
Residential RSL	***2.3***	***2.0***	***1.9***	***Var.***	***Var.***
Commercial RSL	***9.6***	***9.3***	***8.5***	***Var.***	***Var.***

Low concentration of various metals was detected; however, these were all well below the California Human Health Screening Levels (CHHSLs) as set by the DTSC. Due to these results, the historic use of the Property as agricultural land is not considered to be a REC in connection with the Property".

This assessment has revealed no evidence of recognized environmental conditions in connection with the Property."

Third Party Report Review of Phase I Environmental Site Assessment (Review) City of Menifee Trac# 31174, PLN21-0199 - Golden Meadows Project, Assessor's Parcel Numbers (APNs) 360300002, -03, -04, -05, -06, -09, 360350001 Northwest of the Intersection of Wicker Road and Ascot Way, Menifee California 92584 prepared by SCS Engineers dated July 12, 2021. The report indicated the following of the Phase I Environmental Site Assessment review:

> *"SCS recommends that if the City of Menifee acts in a capacity as a relying party for the Site (i.e., as a lender extending credit to be secured by the Site, any purchaser, transferee or assignee, of a mortgage loan [or any portion thereof]), that the City of Menifee consider requesting a reliance letter from Hillman as a relying party for the Phase I ESA report for the Site".*

3.2 User Questionnaire

Section 6 of the ASTM E1527-13 standard describes certain tasks required to be performed by the report User in order to qualify for landowner liability protections to CERCLA liability. To assist the report User to meet these requirements, the ASTM E1527-13 standard recommends a questionnaire of inquiries (User Questionnaire) specified in 40 CFR 312.25, 312.28, 312.29, 312.30, and 312.31 be provided to the original report User. A User Questionnaire has been provided to the report User; however, a completed questionnaire was not returned to Hillmann.

Question:	Yes/No:	Detail:
Environmental liens that are filed or recorded against the property: Did a search of recorded land title records identify any environmental liens filed or recorded against the property under federal, tribal, state or local law?	NR	*No Response*
Activity and use limitations that are in place on the property or that have been filed or recorded against the property: Did a search of recorded land title records (or judicial records where appropriate, identify any AULs, such as engineering controls, land use restrictions or institutional controls that are in place at the property and/or have been filed or recorded against the property under federal, tribal, state or local law?	NR	
Specialized knowledge or experience of the person seeking to qualify for the LLP: Do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?	NR	
Relationship of the purchase price to the fair market value of the property if it were not contaminated: Does the purchase price being paid for this property reasonably reflect the fair market value of the property? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property?	NR	
Commonly Known or Reasonably Ascertainable Information: Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example,		
-Do you know the past uses of the property?	NR	
-Do you know of specific chemicals that are present or were once present at the property?	NR	
-Do you know of spills or other chemical releases that have taken place at the property?	NR	

Question:	Yes/No:	Detail:
-Do you know of any environmental cleanups that have taken place at the property?	NR	
The degree of obviousness of the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation: Based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of releases at the property?	NR	
Litigation/Administrative Proceedings/Government Notices As the User of this ESA, do you have knowledge of (1) any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, or from the property; (2) any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on or from the property; and (3) any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products.	NR	

NR-no response

3.3 Reason for Performing Phase I ESA

The User did not indicate the purpose of the assessment. In accordance with ASTM E1527-13, it is assumed that the Phase I ESA was being performed in order to qualify for landowner liability protection to CERCLA liability.

4.0 RECORDS REVIEW

4.1 Physical Setting Sources

The following physical setting sources were reviewed:

Source	Discussion
USGS 7.5 minute Topographic Map Data: (EDR Geocheck-Physical Setting Source Addendum)	The Property lies at an elevation of approximately 1,559 feet above mean sea level. An interpretation of topographic contour lines as well as a review of the EDR Geocheck-General Topographic Gradient suggested terrain sloping downward towards the south-southwest. The closest down gradient water body is a riverine that flows through the Property from north to south.
USDA SCS Soil Data: (EDR Geocheck-Physical Setting Source Addendum)	The soil type at the Property is classified as "Yokohl". This soil type is described as loam with very slow infiltration rates. The soils are clayey, have a high-water table, or are shallow to an impervious layer.
Geologic Data: (EDR Geocheck-Physical Setting Source Addendum)	The geologic formation in the vicinity of the Property is described as a Plutonic and Intrusive Rocks of the Mesozoic Era, Cretaceous System, Cretaceous granitic rocks series.
Prior Env. Reports: (Section 3.1)	No additional relevant site specific geologic data was noted from a review of the prior environmental reports listed in Section 3.1.
Additional Sources/ Data:	No additional physical setting sources or data was obtained.
Groundwater Flow Discussion:	Based on a review of the above information as well as observation of the site, the direction of shallow groundwater flow at the site is inferred to be towards the south-southwest.
NWI Wetlands Data: (EDR Geocheck-Physical Setting Source Addendum)	No NWI mapped wetlands areas were depicted at the Property.

4.2 Historical Use – Property and Adjoining Properties

Research has been conducted in an attempt to develop a history of the previous uses of the property and surrounding area, in order to help identify the likelihood of past uses having led to RECs in connection with the property. Standard historical sources have been sought in an attempt to document the past uses of the Property as far back as it can be shown that the Property contained structures; or from the time the Property was first used for residential, agricultural, commercial, industrial or governmental purposes.

4.2.1 Fire Insurance Maps

A Certified Sanborn Map Report was obtained from EDR for a review of published historic fire insurance maps for the Property and surrounding area. The following is a summary of site uses and notable details depicted by the available maps:

Year(s)	Prop/Adj	Depicted Use(s)	Notable Details
(No Coverage)	**Property:**		
	Adjoining:		

A copy of the Certified Sanborn Map Report is attached in Appendix D.

4.2.2 City Directories

An EDR City Directory Abstract report was reviewed for data of former occupants of the Property's street address. The following is a generalized summary of the findings of city directory research for past occupants of the Property.

Property	
Use(s) / Occupant(s):	**Years**
None	

The EDR City Directory Abstract report was also reviewed for listings of historic occupants of the adjoining properties. The following is a general summary of listings of historic adjoining property occupants:

Adjoining Properties	
Use and/or Occupant(s)	**Years**
Primarily residential occupants	1980 - 2000
Primarily residential occupants; Commercial occupants including construction services.	2005 - 2017

A copy of the EDR City Directory report is attached in Appendix D.

4.2.3 Historical Topographic Maps

Historical topographic maps of the Property and vicinity obtained from an EDR Historical Topographic Map report (as attached in Appendix D) have been reviewed. The following interpretation of land usage was made by review of the maps:

Year(s)	Summary	
1901	**Property:**	One building is depicted to the west of the Property.
	Adjoining:	No improvements or other features were depicted.
1942, 1943, 1947	**Property:**	Three buildings are depicted to the west of the Property and the remaining portion of the Property is undeveloped. An unpaved road is depicted to the eastern portion of the Property.
	Adjoining:	Several structures are depicted to the north, south, and west of the Property. The property to the east is not depicted with any structures or roads. Evans Road, abutting the Property to the west, and Wickerd Road, abutting the Property to the south, are depicted as unimproved roads.
1953, 1973, 1979	**Property:**	Wooded land is depicted to the northeast corner of the Property; Three buildings are depicted to the west along Evans Road. An unimproved road is depicted on the western portion of the Property.
	Adjoining:	Few structures are depicted to the north, south, and west. The property to the east is not depicted with any structures or roads. Evans Road, abutting the Property to the west, and Wickerd Road, abutting the Property to the south, are depicted as paved roads.
2012	**Property:**	No improvements or other features were depicted.
	Adjoining:	No improvements or other features were depicted.

4.2.4 Historical Aerial Photographs

Historical aerial photographs of the Property and vicinity obtained from an EDR Aerial Photo Decade Package report, as attached in Appendix D, were reviewed. The following interpretation of land usage was made by review of the aerial photographs:

Year(s)	Summary of Interpretation	
1938	**Property:**	Agricultural land; A riverine is depicted through the Property. There is a small area of development on the western portion of the Property along Evans Road.
	Adjoining:	Orchards to the north; A residential property is depicted to the south
1949, 1953, 1961, 1967, 1978	**Property:**	The Property appears to be largely used for agricultural land. There is a small area of development on the western portion of the Property along Evans Road.
	Adjoining:	Orchards to the north
1985, 1989, 1994, 2002	**Property:**	Agricultural land; Several structures are depicted to the west; Wooded land to the north. There is a small area of development on the western portion of the Property along Evans Road. Additional structures are also visible on the northeastern portion of the Property.
	Adjoining:	Orchards to the north; Residential properties to the north and south
2006, 2009, 2012, 2016	**Property:**	Undeveloped land
	Adjoining:	Residential

4.2.5 EDR High-Risk Historical Records

The EDR Radius Map™ report, which is discussed in greater detail in Section 4.3, provided a search of proprietary databases of potential historical high-risk uses at or in the vicinity of the Property. These databases include EDR Historic Cleaners – a database of property addresses with records of historical occupancy by suspected cleaners businesses; EDR Historic Auto – a database of property addresses with records of historical occupancy by potential automotive gas/filling stations and repair facilities; and EDR MGP- a database of sites historically occupied by manufactured gas plants and related facilities.

EDR Database	On-site Listings:	Adjoining/Off-Site Listings
Historic Cleaners: (on-site/adjoining only)	None	None
Historic Auto: (on-site/adjoining only)	None	None
MGP: (1-mile distance)	None	None

4.2.6 Petroleum/Natural Gas Well Review

The historical record sources and the California Geologic Energy Management Division (CalGEM) online mapping application were reviewed for records of historic petroleum and/or natural gas wells at the Property. No record of any historical petroleum/natural gas wells at or adjoining the Property was identified.

4.2.7 Additional Historical Data

Where applicable, the following additional pertinent historical data was obtained:

Interviews/Anecdotal:	No additional pertinent historical data was obtained.
Local Gov't Records:	No additional pertinent historical data was obtained.
Prior Env. Reports: (Section 3.1)	Prior environmental reports reviewed as part of this assessment, as detailed in Section 3.1, did not provide additional pertinent detail of historical site usage. *A prior report from Hillmann identified the potential for elevated pesticide levels of the Property due to historic use as agricultural land and recommended further investigation. During this site visit Hillmann collected twenty-four (24) soil samples and analyzed them for organochlorine pesticides (OCPs), Title 22 metals, and polycyclic aromatic hydrocarbons (PAHs). The results were below the detection level for all OCPs and PAHs analyzed. Low concentration of various metals were detected, however these were all well below the California Human Health Screening Levels (CHHSLs) as set by the DTSC. Due to these results, the historic use of the Property as agricultural land is not considered to be a REC in connection with the Property.*
Site Observations:	Indications of historic uses of the Property or adjoining properties were not observed during the site reconnaissance.
Other Sources:	No additional pertinent historical data was obtained.

4.2.8 Summary of Identified Historic Uses

The following table presents a summary of the types and approximate date ranges of identified prior uses of the Property:

Property	
Date Range	**Use**
1901 to 2000s	Agricultural land
2002 to present	Undeveloped

The following table presents a summary of the types of identified prior uses of the adjoining properties:

Adjoining Properties	
Date Range	**Use**
1930s to 2000s	Orchards and residential
2000s to present	Mix of residential and commercial uses

4.2.9 Historical Records Data Failure

The ASTM E1527-13 standard defines data failure as a failure to achieve the ASTM specified historical research objectives after reviewing the standard historical sources that are reasonably ascertainable and likely to be useful. The objective is to identify all obvious uses of the property from the present, back to the property's first developed use, or back to 1940, whichever is earlier.

Furthermore, records of historic use/conditions should be sought in intervals no less than approximately five years, unless the property conditions appear unchanged over a longer interval.

Objective	Met?	Detail	Significant?
First developed use/date determined?	No	The earliest documented use of the Property was agricultural land circa 1938.	Yes
Record sources at 5-year intervals back to 1940 or first developed use?	Yes	Historical record gaps exceeding five years were encountered. However, significant site-use changes or undiscovered site uses appear unlikely to have occurred during the record gaps.	No
All obvious prior uses identified?	Yes	See Section 4.2.8.	Yes

Please refer to Section 2.3 for additional discussion of data gaps and their significance to the findings of the assessment.

4.2.10 Historic Uses REC Discussion

The review of historical records did not indicate evidence of a REC in connection with the Property.

4.3 Standard Environmental Record Sources

A regulatory database report, titled EDR Radius Map™ Report, prepared by Environmental Data Resources of Shelton, CT was obtained and reviewed. The report provided a search of standard environmental record sources for listings of the Property, adjoining properties and sites within the surrounding area; and has been reviewed for the purpose of identifying listings suggesting a potential impact to the Property due to presence or migration of hazardous substances and/or petroleum products. Additional descriptions of the meaning and significance of the regulatory databases can be found in the regulatory database report in Appendix E. The EDR Radius Map™ Report provided a search of the following database categories in accordance with the requirements of the ASTM Standard E1527-13:

Regulatory Database	Search Distance
Fed. National Priorities List (NPL/a.k.a. "Superfund" sites) & Proposed NPL	1-mile
Fed. Delisted NPL	½-mile
Fed. Superfund Enterprise Management System (SEMS; formerly CERCLIS)	½-mile
Fed. SEMS-ARCHIVE (formerly known as CERCLIS NFRAP)	½-mile
Fed. RCRA Corrective Action Sites (CORRACTS)	1-mile
Fed. RCRA Transport/Storage/Disposal (TSD) sites	½-mile
Fed. RCRA Generators (LQG, SGQ & CESQG)	Site & Adjoining
Fed. Institutional Control/Engineering Control (IC/EC) Registries	Site only
Fed. Emergency Response Notification System (ERNS)	Site only
State/Tribal Hazardous Waste Sites (SHWS)	1-mile
State/Tribal Landfill and/or Solid Waste Disposal (LF/SWF)	½-mile
State/Tribal Leaking Storage Tanks	½-mile
State/Tribal Registered Storage Tanks	Site & Adjoining
State/Tribal IC/EC Registries	Site

State/Tribal Voluntary Cleanup Sites	½-mile
State/Tribal Brownfields	½-mile
Additional Federal, State, Tribal and Local Environmental Databases	Variable

Reported distances for adjoining listings discussed in Section 4.3.4, if applicable, are approximate and indicative of the presence of a public roadway or right-of-way between the adjoining site and Property.

The reported gradients indicated where applicable in Sections 4.3.4 and 4.3.5 have been estimated based on a number of factors including but not necessarily limited to field observation, review of topographic maps, database listing details and/or site specific geo-technical data.

4.3.1 Supplemental Database Listings

The regulatory database report was also reviewed for listings on supplemental databases, in addition to the Standard Environmental Record Sources. Any property or adjoining property listings on such databases of significant concern, if identified, is discussed in Sections 4.3.3 and 4.3.4. Otherwise, none of the other supplemental database listings identified by the regulatory database report are considered to be a REC in connection with the Property.

4.3.2 Limited Tier I Vapor Encroachment Screening

Limited analysis of the details of on-site, adjoining and vicinity database sites was conducted to identify potential sources of sub-surface vapor encroachment. This review was based on elements of the ASTM "Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions" (ASTM E 2600-15); and also on elements of "Methodology for Identifying the Area of Concern Around a Property Potentially Impacted by Vapor Migration from Nearby Contaminated Sources" (Buonicore, 2011-S-103-AWMA). Vicinity database sites pertaining to non-petroleum product releases within 1,760 feet of the Property in the up-gradient direction, 365 feet of the Property in the cross gradient direction and 100 feet of the Property in the down gradient direction; and vicinity database sites pertaining to petroleum product releases within 528 feet of the Property in the up-gradient direction, 165 feet of the Property in the cross gradient direction and 100 feet of the Property in the down gradient direction were reviewed to identify active contamination sites with the potential to affect subsurface vapor conditions at the subject property. The potential for vapor encroachment was considered in assessing whether or not a REC exists in connection with the Property when reviewing applicable sites within those distances.

Regulatory database sites with active petroleum or non-petroleum releases that are considered to constitute a vapor encroachment condition (VEC) to the Property, if any, are identified and discussed in Sections 4.3.3, 4.3.4 and 4.3.5.

4.3.3 Property Listings

The following listings of the Property were identified:

Name/Address:	None
Database(s):	
Data Discussion:	
REC Discussion:	
VEC Discussion:	

4.3.4 Adjoining Property Listings

The following adjoining property listings were identified. Reported distances, where applicable, are approximate and indicative of the presence of a public roadway or right-of-way between the adjoining site and Property. The reported gradient has been estimated based on a number of factors including but not necessarily limited to field observation, review of topographic maps, database listing details and/or site specific geo-technical data.

Name/Address:	None				
Database(s):					
Distance in feet:		**Direction:**		**Gradient:**	
Data Discussion:					
REC Discussion:					
VEC Discussion:					

4.3.5 ASTM Search Distance Findings

The following is a discussion of non-adjoining sites identified as located within the ASTM specified search distance surrounding the Property. In order to keep this discussion informative and concise, discussion(s) is/are provided of the listed site(s) for each database category that appears most likely to impact the Property based on distance, area topography and/or regulatory status. Listings of sites within the applicable search distances not specifically discussed below were reviewed and concluded not to be RECs in connection with the Property or VECs based on various factors including distance, area topography, known or inferred groundwater flow direction and/or regulatory status. Listings for the following databases, if identified, have been discussed above in Sections 4.3.3 and 4.3.4: Registered Storage Tanks, Federal RCRA Generators, Federal and State EC/IC, ERNS. A copy of the full regulatory database report, including available details of all listed sites, is included in Appendix E.

Federal NPL				**# of sites:**	0	**Search Distance:**	1-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

Federal Delisted NPL				**# of sites:**	0	**Search Distance:**	1-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							

VEC Discussion:	

Federal SEMS				**# of sites:**	0	**Search Distance:**	½-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

Federal SEMS-ARCHIVE				**# of sites:**	0	**Search Distance:**	½-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

Federal CORRACTS				**# of sites:**	0	**Search Distance:**	1-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

Federal RCRA-TSD				**# of sites:**	0	**Search Distance:**	½-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

State HAZARDOUS WASTE SITE				**# of sites:**	2	**Search Distance:**	1-mile
Notable Listing:	Perris Union High School/Paloma Valley Site/ 31375 Bradley Road						
Distance in feet:	2,962	**Direction:**	N	**Gradient:**	Up		
Data Discussion:	The site is listed under SCH and CERS databases. Site is public education facility listed as school investigation site.						
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.						
VEC Discussion:	Based on the available data, a VEC is not suspected.						

State SOLID WASTE FACILITY/LANDFILL				**# of sites:**	0	**Search Distance:**	½-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

State LEAKING STORAGE TANKS				**# of sites:**	3	**Search Distance:**	½-mile
Notable Listing:	Menifee Union School Dist./26301 Garboni Rd						
Distance in feet:	1242	**Direction:**	WNW	**Gradient:**	Down/Cross		

Data Discussion:	The site is listed with completed case closed status as of 11/04/2003.
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.
VEC Discussion:	Based on the available data, a VEC is not suspected.

State VOLUNTARY CLEANUP SITES				**# of sites:**	0	**Search Distance:**	½-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

State BROWNFIELD SITES				**# of sites:**	0	**Search Distance:**	½-mile
Notable Listing:							
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

UNMAPPED/ORPHAN LIST SITES	
Notable Listings:	Hillmann has also reviewed a list of unmapped sites (a.k.a. "Orphan List" sites) indicated by the database report. Unmapped sites that were identified as falling within an applicable specific search distance or warranting discussion have either been discussed in the preceding tables or are detailed below: Proposed Elementary School No. 15 is listed as an orphan site under the databases ENVIROSTOR and SCH. The property is located at Briggs Rd and Wicker Rd about 2.25 miles from the Property.

4.4 Additional Environmental Record Sources

Requests have been submitted to local, municipal and state agencies for pertinent records pertaining to the Property, particularly with regard to potential environmental concerns such as petroleum storage tanks, storage and usage of hazardous substances and petroleum products, and/or known or suspected environmental contamination. Where applicable, internet research of government environmental regulatory databases was also conducted, as well as a general cursory internet search of the Property address, for information indicative of a REC. The following table summarizes the findings of the research:

Source	Type of Request	Outcome
EPA Envirofacts	Online search	Hillmann reviewed available on-line records pertaining to the Property. No information indicative of a REC was identified.
EPA MyProperty	Online search	Hillmann searched online for records pertaining to the Property. No records pertaining to the property were found.
City of Menifee	FOI request	Hillmann reviewed records from code enforcement division was reviewed that showed illegal dumping and vehicle abatement that has been resolved.
City of Menifee-Building and Safety	FOI request	Building permits were not available as the Property is undergoing planning approval and there were no building permits issued.

Source	Type of Request	Outcome
South Coast Air Quality Management District (SCAQMD)	FOI request	No response was received prior to report issuance.
Regional Water Quality Control Board (RWQCB)	FOI request	No response was received prior to report issuance.
CA DTSC (Envirostor)	FOI request	A response was recieved stating that no records were found.
Riverside County Fire Department	FOI request	No response was received prior to report issuance.
Real Quest	Online search	Hillmann reviewed available on-line records pertaining to the Property. No information indicative of a REC was identified.

5.0 SITE RECONNAISSANCE

5.1 Methodology and Limiting Conditions

The site reconnaissance consisted of visual and/or physical observations of the Property and improvements, adjoining properties as viewed from the Property boundaries and the surrounding area based on visual observations from adjoining public thoroughfares. Building exteriors were observed at ground level, unless otherwise indicated. Where applicable, representative areas of building interiors were accessed and observed to the extent they were made safely accessible with the cooperation of the site escort.

Site Inspection Personnel:	Ms. Shilpa Sunil
Property Escort/Company:	NA
Inspection Date:	July 30, 2021
Weather Conditions:	Sunny, 80 degrees F

5.1.1 Significant Inaccessible Areas

No significant areas of the Property inaccessible at the time of the inspection were noted.

5.1.2 Significant Limiting Site Conditions

No significant limiting site conditions were noted at the time of the site reconnaissance.

5.2 General Site Setting

5.2.1 Site and Vicinity Characteristics

Abutting Roadways:	Wickerd Rd. to the south; Sherman Rd to the east; Evans Rd. to the west
Current Property Use:	Undeveloped land
Evidence of Past Property Uses:	Agricultural use
Evidence of Past Adjoining Property Uses:	None observed.
Surrounding Area Uses:	Residential, school

5.2.2 Current Adjoining Property Uses

Dir	Street Address	Description
N	Garbani Rd	Residential
W	Evans Rd	Menifee Elementary and Middle School; Residential
E	Sherman Rd	Vacant land
S	Wickerd Rd	Residential

No visual observations indicative of a potential environmental concern were noted on the adjoining properties.

5.2.3 Topographic Characteristics

Terrain:	Flat to gently sloping and hilly terrain
Direction of Downward Slope:	Towards the south-southwest
On-site Water Bodies:	None observed
Other Significant Features:	None observed

5.2.4 General Description of Structures

Buildings/# of Floors	NA
Approx. Building Area:	NA
Approx. Year Built:	NA
Ancillary Structures:	None observed
Sources of Heating & Cooling:	NA
Potable Water/Sewage Disposal:	No potable water or sewer services were present at the Property.

5.3 Interior & Exterior Observations

5.3.1 Storage/Usage of Hazardous Substances and Petroleum Products

The following hazardous substances and petroleum products were observed to be stored and used by property occupants:

Occupant	Substance	Qty/Container Type	Storage Conditions
NA	No significant storage or use noted		

5.3.2 Drums

No hazardous substance or petroleum product drums were noted on the Property.

5.3.3 Unidentified Substance Containers

No unidentified substance containers suspected of containing hazardous substance or petroleum product were noted on the Property.

5.3.4 Other Hazardous Substances/Petroleum Products

No other containers of hazardous substances or petroleum products were noted on the Property.

5.3.5 Bulk Petroleum/Hazardous Material Storage Tanks

The following storage tanks for bulk petroleum or hazardous material storage were identified or reported to be present; or are suspected to be present based on visual observations:

AST/ UST	Product	Capacity	Construction	Year Installed	Status	Location/Notes
(none)						

5.3.6 PCBs in Oil Filled Electrical/Hydraulic Equipment

No oil-filled electrical or hydraulic equipment was identified at the Property.

5.3.7 Odors

No strong, pungent or noxious odors were noted at the Property.

5.3.8 Pools of Liquid

No standing water or pools of liquid likely to contain hazardous substances or petroleum products were noted at the Property.

5.3.9 Interior Stains or Corrosion

No interior areas were identified at the Property.

5.3.10 Interior Drains/Sumps

No interior areas were identified at the Property.

5.3.11 Exterior Pits/Ponds/Lagoons

No exterior pits, ponds or lagoons was identified on the Property in connection with waste treatment or disposal.

5.3.12 Stained Soil, Pavement/Stressed Vegetation

No stained soil, pavement or stressed vegetation was observed at the Property.

5.3.13 On-Site Solid Waste Disposal/Fill Material

No evidence of any on-site solid waste dumping was noted at the Property. No evidence of recently deposited fill materials was observed at the Property.

5.3.14 Waste Water

No sanitary sewer discharges were identified at the Property.

5.3.15 Septic Systems

No septic systems were identified at the Property.

5.3.16 Wells

No potable, monitoring or other groundwater wells were identified at the Property.

Two water wells were observed on the southwest side of the Property.

5.3.17 Railroad Spurs

No railroad spurs were identified on the Property.

6.0 INTERVIEWS

6.1 Interviews with Past and Present Owners and Occupants

Subject	Name/Affiliation	Summary
Property Owner / Representative	Mr. Brian Hardy of Richard Communities	Mr. Hardy completed an environmental questionnaire. Pertinent information from the interview and questionnaire, where applicable, has been referenced in various sections of this report.
Property Occupants	Not applicable	Property was unoccupied.
Past Owners, Occupants, Operators	Not applicable	Past owners/occupants of the Property were not available for interview at the time of the assessment.
Owners/Occupants of Adjoining or Nearby Properties	Not applicable	The Property was not an abandoned property with evidence of unauthorized uses or uncontrolled access; therefore, interviews with adjoining or nearby property owners or occupants were not conducted.

6.2 Interviews with State and/or Local Government Officials

Written and on-line requests for environmental records of the Property from State and Local governmental agencies are detailed in Section 4.4.

7.0 BUSINESS ENVIRONMENTAL RISKS

In accordance with the contract agreement for this assessment, Hillmann has performed cursory reviews of several potential Business Environmental Risks (also known as "Non-Scope Considerations"). The ASTM E1527-13 standard defines the term business environmental risk (BER) as, *"a risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate, not necessarily limited to those environmental issues required to be investigated in this practice."*

7.1 Asbestos-Containing Material (ACM)

The contracted scope of work included a cursory visual screening of the accessed portions of buildings at the Property built prior to 1990 for suspect asbestos containing materials (ACM). The information provided in this section, where applicable, is limited to identification of potential suspect materials in the readily accessible and observed areas of the building, and their general condition. This is not intended to be a comprehensive survey for the presence of ACM, and no testing has been conducted.

No buildings were present at the Property.

7.2 Lead-Based Paint

The contracted scope of work included a cursory visual screening of the condition of painted surfaces in the accessed areas of residential buildings/units built prior to 1980. This is not intended to constitute a comprehensive survey for LBP or potential lead hazards, and no testing has been conducted.

No residential buildings were present at the Property.

7.3 Radon

Data compiled by the USEPA, as summarized by the regulatory database report, indicated that the Property is located in an area classified as Zone 2 or 'moderate risk' area for radon. Radon testing was not included in the scope of this assessment.

7.4 Mold/Microbial Damage

As per the contracted scope of work, Hillmann conducted a cursory visual screening of the accessed areas of the building for evidence of significant damage to building materials and finishes as result of moisture intrusion and/or mold/microbial growth. Given the absence of building structures at the Property, mold/microbial growth is not considered to be a significant environmental concern.

7.5 NWI Mapped Wetlands

As indicated in the Physical Setting Source table of Section 4.1, no NWI mapped wetlands areas were depicted at the Property by the EDR Geocheck-Physical Setting Source Addendum (attached in Appendic E).

The scope of work for this assessment excludes a visual determination of regulated wetlands at the Property. It is emphasized that, regardless of the wetlands data obtained via the EDR Geocheck-Physical Setting Source Addendum, a delineation of regulated wetlands by a qualified professional would be warranted to determine the presence or absence of regulated wetlands at the Property.

7.6 Lead in Drinking Water

The scope of work for this assessment included a review of the potential for elevated levels of lead in drinking water by determining the source of the drinking water supply and a review of available compliance or testing data.

8.0 REFERENCES

ASTM E1527-13-Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process; ASTM International, 2013

ASTM E12600-15-Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transaction, ASTM International, 2015

EDR Radius Map Report with GeoCheck™, Environmental Data Resources, 2021

EDR City Directory Abstract Report, Environmental Data Resources, 2021

EDR Sanborn Map Report, Environmental Data Resources, 2021

Methodology for Identifying the Area of Concern Around a Property Potentially Impacted by Vapor Migration from Nearby Contaminated Sources; A. Buonicore, 2011

Phase I Environmental Site Assessment – Golden Meadows, Menifee, California, Hillmann Consulting, LLC, January 25, 2013

Phase I Environmental Site Assessment – Golden Meadows, Tract 31174, Menifee, California, Hillmann Consulting, LLC, August 31, 2017

Third Party Report Review of Phase I Environmental Site Assessment (Review) City of Menifee Trac# 31174, PLN21-0199 - Golden Meadows Project, Assessor's Parcel Numbers (APNs) 360300002, -03, -04, -05, -06, -09, 360350001 Northwest of the Intersection of Wicker Road and Ascot Way, Menifee California, SCS Engineers, July 12, 2021

9.0 APPENDICES

Appendix A	Site Diagram / Vicinity Map
Appendix B	Site Photographs
Appendix C	Questionnaires / User Provided Information
Appendix D	Historical Records Documentation
Appendix E	Regulatory Records Documentation
Appendix F	Other Documents / Lab Results
Appendix G	Project Personnel Qualifications

APPENDIX A

MAPS / DIAGRAMS

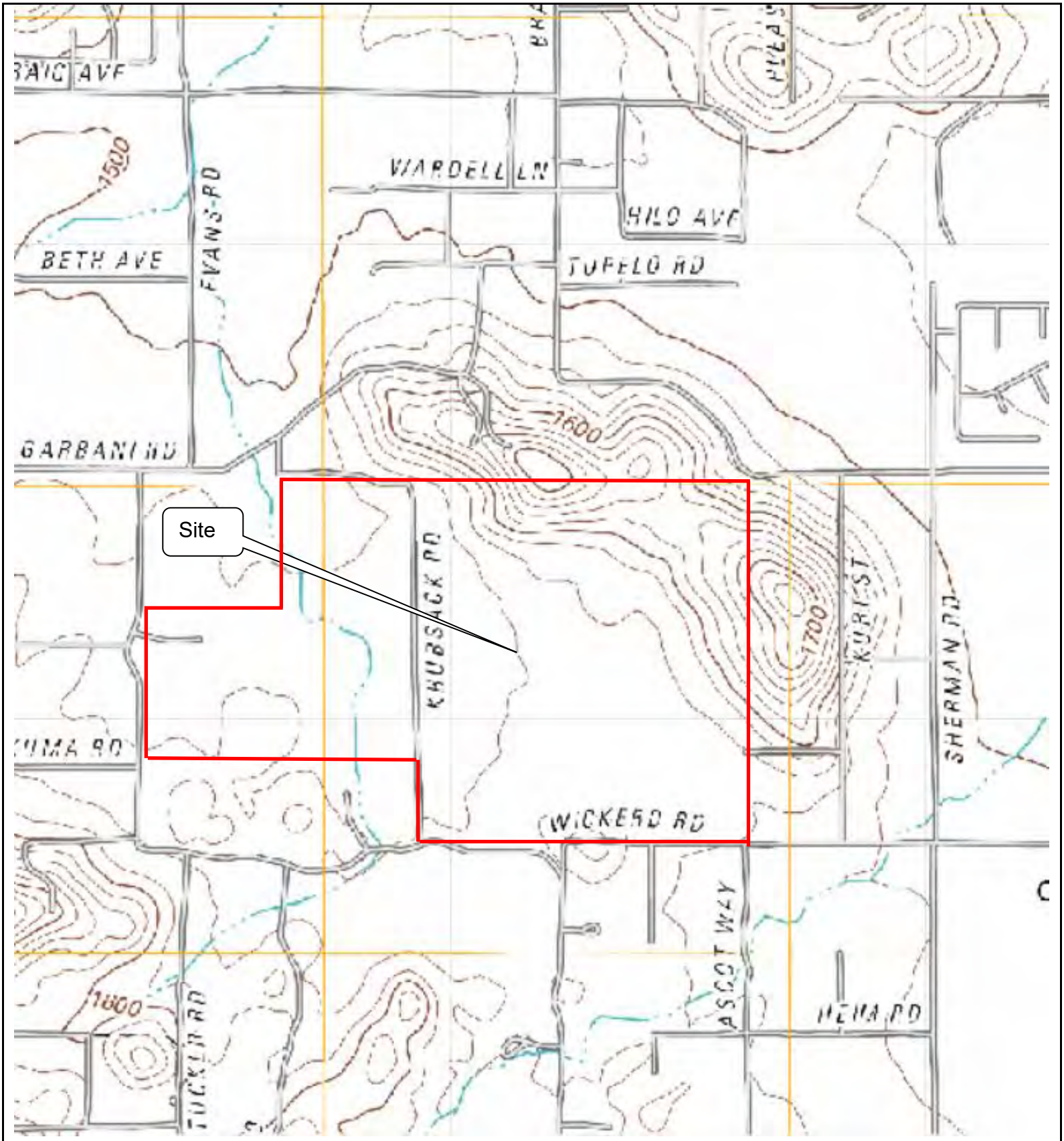

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Figure 1: Site Vicinity Map

NW Corner of Wickerd Road and Ascot Way
Menifee, California

N

SCALE: (NOT TO SCALE)

PROJECT No.: C3-8557

HILLMANN CONSULTING

Figure 2: Site Diagram

NW Corner of Wickerd Road and Ascot Way
Menifee, California

N

SCALE: (NOT TO SCALE)

PROJECT No.: C3-8557

APPENDIX B

SITE PHOTOGRAPHS

SITE PHOTOGRAPHS

View of the Property looking northeast

View of the Property looking west

View of one well on the Property

Pole mount transformers along Evans Rd. toward the southeast

View of the second well on the Property

Trash on the Property

PHASE I ESA - SITE PHOTOGRAPHS

NW Corner of Wickerd Road and Ascot Way,
Menifee, California

Project No.:	C3-8557

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SITE PHOTOGRAPHS

View of adjoining property to the north

PHASE I ESA - SITE PHOTOGRAPHS

NW Corner of Wickerd Road and Ascot Way,
Menifee, California

Project No.:	C3-8557

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APPENDIX C

QUESTIONNAIRES/USER PROVIDED DOCUMENTATION

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PHASE I ENVIRONMENTAL SITE ASSESSMENT

GOLDEN MEADOWS
TRACT 31174
MENIFEE, CALIFORNIA 92584

Prepared For:

Richland Communities
3161 Michelson Drive, Suite 425
Irvine, California 92612

August 31, 2017

Hillmann Project No: C3-6927

Your Property. Our Priority.
1745 W. Orangewood Avenue, Suite 110, Orange, CA 92868
Telephone (714) 634-9500 Fax: (714) 634-9507
www.Hillmann**Consulting.com**

HILLMANN
CONSULTING

August 31, 2017

Mr. Mike Byer
Richland Communities
3161 Michelson Drive, Suite 425
Irvine, CA 92612

RE: Phase I Environmental Site Assessment
Golden Meadows
Tract 31174
Menifee, CA 92584
Hillmann Project Number: C3-6927

Dear Mr. Byer:

Hillmann Consulting, LLC, is pleased to provide the results of our Phase I Environmental Site Assessment of the above referenced property. This assessment was performed in accordance with the scope and limitations of ASTM Practice E 1527-13, which is the latest version of the E1527 standard published by the ASTM, and All Appropriate Inquiries (AAI) Final Rule 40 CFR Part 312.

This report is for the exclusive use of the entities named on the front cover, and no other party shall have any right to rely on any service provided by Hillmann Consulting, LLC, without prior written consent.

We appreciate the opportunity to provide environmental due diligence services. If you have any questions concerning this report, or if we can assist you in any other matter, please contact the Project Manager at (714) 634-9500.

Sincerely,
Hillmann Consulting, LLC

Stephen Bartlett
Environmental Technician

Christopher W. Baker
Vice President of Operations

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List of Abbreviations/Acronyms

Hillmann may use the following abbreviations and acronyms for common terminology described in our report. Not all abbreviations or acronyms may be applicable to this report:

ACM	– Asbestos Containing Material
AST	– Aboveground Storage Tank
ASTM	– American Standard for Testing Materials
CERCLA	– Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	– Comprehensive Environmental Response Compensation and Liability Information System
CESQG	– Conditionally Exempt Small Quantity Generator
CORRACTS	– Corrective Action Sites
CREC	– Controlled Recognized Environmental Condition
DNPL	– Delisted National Priority List
DTSC	– Department of Toxic Substances Control
ENG	– Engineering
ERNS	– Emergency Response Notification System
FOI	– Freedom of Information
FOIA	– Freedom of Information Act
FOIL	– Freedom of Information Letter
HVAC	– Heating Ventilation & Air Conditioning
HREC	– Historic Recognized Environmental Condition
IAQ	– Indoor Air Quality
INST	– Institutional
LBP	– Lead-Based Paint
LQG	– Large Quantity Generator
LUST	– Leaking Underground Storage Tank
MSDS	– Material Safety Data Sheet
NFA	– No Further Action
NFRAP	– No Further Remedial Actions Planned
NPDES	– National Pollutant Discharge Elimination System
NPL	– National Priority List
RCRA	– Resource Conservation and Recovery Act
RCRIS	– Resource Conservation and Recovery Information System
REC	– Recognized Environmental Condition
RWQCB	– Regional Water Quality Control Board
SCAQMD	– South Coast Air Quality Management District
SQG	– Small Quantity Generator
TSDF	– Treatment Storage and/or Disposal Facility
USEPA	– United States Environmental Protection Agency
UST	– Underground Storage Tank

1.0 EXECUTIVE SUMMARY

Hillmann Consulting, LLC (Hillmann), performed a Phase I Environmental Site Assessment (ESA) of Tract 31174 in Menifee, California (the "Property"). This assessment has been conducted in accordance with the ASTM Standard Practice E 1527-13 for Phase I Environmental Site Assessments and All Appropriate Inquiries (AAI) Final Rule 40 CFR Part 312.

1.1 Project Details Summary Table

A summary of the pertinent details of the project is provided below:

PROJECT SUMMARY TABLE						
Name of Client		Richland Communities				
Client Project No.:		N/A				
Client Contact:		Mr. Mike Byer				
Description of Project		Phase I Environmental Site Assessment				
Project Name:		Golden Meadows				
Street Address:		Tract 31174				
City:	Menifee	**County:**	Riverside	**State:**	California	
Tax ID/Parcel Number:		360300002, -03, -04, -05, -06, -09, 360350001				
Zoning Designation:		Vacant Land				
Approx. Property Area:		206.8 acres				
Approximate Building Area:		Not Applicable				
Year Built:		Not Applicable				
General Type of Usage:		Vacant Agricultural				
Property Owner:		Richland				
Occupant(s):		N/A				
Assessment Personnel:		Mr. Stephen Bartlett				
Property Contact:		N/A				
Property Escort(s):		N/A				
Inspection Date:		August 21, 2017				
Weather Conditions:		Clear, 80 degrees F				

1.2 Findings Summary Table

The following table summarizes the key findings of this assessment. This table, alone, does not constitute the complete assessment. The report must be reviewed in its entirety.

Assessment Section	No Sig. Concern	Potential Env Concern	REC	Recommended Follow-up	Rep. Ref.
User Provided Info	X				3.0
Data Gaps	X				2.5
Regulatory Review	X				4.1
Historical Review	X				4.4
Site Use	X				5.2
Adjoining Properties	X				4.1.2 5.2.8
Hazardous Materials	X				5.3
Bulk Petroleum Storage	X				5.3
PCBs	X				5.3
Waste / Discharges	X				5.3
Asbestos Containing Materials (ACM)	X				7.1
Lead Based Paint (LBP)	X				7.2
Radon	X				7.3
Mold	X				7.4
Wetlands	X				7.5

NA = Not Applicable, TBD = To Be Determined, UNK = Unknown

1.3 General Description, Current and Historic Property Use

The Property consists of seven rectangular shaped parcels located one mile west of Interstate 215, South of Garbani Road, north of Wickerd Road, and east of Evens Road in Menifee, California. The site is currently vacant land. The total Property area is approximately 206.8 acres. The Property is located in a rural area characterized by a mixture agricultural land and single-family residences. The terrain of the Property appeared to be relatively hilly. No natural surface bodies of water were observed.

Prior to 1938 to at least 2002, the Property consisted largely of agricultural land with what appears to be a small development related to agricultural purposes on the west portion of the Property. Since at least 2005, the Property has been used as undeveloped land.

1.4 Findings, Opinions, and Conclusions

1.4.1 Notable Findings

A prior report from Hillmann identified the potential for elevated pesticide levels of the Property due to historic use as agricultural land and recommended further investigation. During this site visit Hillmann collected twenty-four (24) soil samples and analyzed them for organochlorine pesticides (OCPs), Title 22 metals, and polycyclic aromatic hydrocarbons (PAHs). The results were below the detection level for all OCPs and PAHs analyzed. Low concentration of various metals were detected, however these were all well below the California Human Health Screening Levels (CHHSLs) as set by the DTSC. Due to these results, the historic use of the Property as agricultural land is not considered to be a REC in connection with the Property.

1.4.2 Non-ASTM Scope Considerations

Hillmann has also performed preliminary evaluations for ASTM "Non-Scope" items, such as asbestos-containing materials (ACM), lead-based paint, radon, mold and wetlands. Our observations and research did not identify any notable concerns.

1.4.3 Significant Data Gaps

No data gaps that significantly impacted Hillmann's ability to identify RECs in connection with the Property have been identified.

1.4.4 Recognized Environmental Conditions

Hillmann has performed a Phase I Environmental Site Assessment in accordance with the scope and limitations of ASTM Practice E 1527-13 of the Property as described in Section 2 of this report. Any additions to, exceptions to, or deletions from this practice are also described in Section 2 of this report. This assessment has revealed no evidence of *recognized environmental conditions* in connection with the Property, except for the following:

Recognized Environmental Conditions (RECs):

- No evidence of any RECs in connection with the Property was identified.

Controlled Recognized Environmental Conditions (CRECs):

- No evidence of any CRECs in connection with the Property was identified.

Historical Recognized Environmental Conditions (HRECs):

- No evidence of any HRECs in connection with the Property was identified.

1.5 Recommendations

1.5.1 Recognized Environmental Conditions

Hillmann will update the report once the results from the soil samples collected by Hillmann have been received.

1.5.2 Non-ASTM Considerations

No investigation into non-ASTM considerations is warranted at this time.

2.0 INTRODUCTION

2.1 Purpose and Scope

This assessment was conducted utilizing generally accepted Phase I ESA industry standards in accordance with the ASTM Standard Practice E 1527-13. The ASTM describes these methodologies as representing good commercial and customary practice in the United States of America for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products. As such, this practice is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner or bona fide prospective purchaser limitations on CERCLA liability (hereinafter, the "landowner liability protections," or "LLPs"): that is, the practice that constitutes all appropriate inquiries into the previous ownership and uses the property consistent with good commercial and customary practice as defined at 42 U.S.C. §9601(35) (B). The primary goal of the processes established by ASTM E1527-13 is to identify *recognized environmental conditions* in connection with the Property.

The term *recognized environmental condition (REC)* is defined by the ASTM as the presence or likely presence of any hazardous substances or petroleum products in, on or at a property: (1) due to a release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.

The ASTM has also defined the terms *historical recognized environmental conditions* and *controlled recognized environmental conditions* as two additional types of RECs. The term *historical recognized environmental condition (HREC)* is defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the Property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the Property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls or engineering controls).

The term *controlled recognized environmental condition (CREC)* is defined as a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.

Conditions determined to be *"de minimis conditions"* are not considered to be RECs nor CRECs. *De minimis condition* is defined by the ASTM as a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies."

The chief components of this assessment are described as follows:

- A non-invasive visual reconnaissance of the Property and adjoining properties in accordance with ASTM guidelines for evidence of RECs.

- Interviews of past and present owners and occupants and state and local government officials, seeking information related to the potential presence of RECs at the Property.

- A review of standard physical record sources for available topographic, geologic and groundwater data.

- Review of standard historic record sources, such as fire insurance maps, city directories, aerial photographs, prior reports and interviews, etc., to determine prior uses of the Property from the present, back to the Property's first developed use, or back to 1940, whichever is earlier.

- Review of standard environmental record sources including federal and state environmental databases, and additional environmental record sources, to identify potential regulatory concerns with the Property, adjoining properties and properties located within the surrounding area.

These methodologies are described as representing good commercial and customary practice for conducting an Environmental Site Assessment of a property for the purpose of identifying recognized environmental conditions.

2.1.1 Non-ASTM Scope Considerations

In accordance with our contract agreement, Hillmann may have addressed the following potential environmental concerns that are outside of the requirements of the ASTM E1527-13 standard:

Asbestos-Containing Materials (ACM): A preliminary visual inspection for the presence of suspect ACM within the accessed areas of buildings on the Property.

Lead-Based Paint (LBP): A preliminary visual inspection of the condition of painted surfaces in the accessed areas of buildings on the Property.

USEPA Designated Radon Potential: Review of general non-site specific data published by the USEPA regarding the potential for elevated indoor levels of radon gas to occur in the area of the Property.

Mold: A preliminary visual inspection within the accessed areas of buildings on the Property for evidence of systemic microbial problems, including visible mold growth, water damaged building materials or musty odors.

Wetlands: A preliminary review of data published by the US Fish and Wildlife Service regarding the presence or absence of mapped wetlands on the Property. The US Fish and Wildlife Service wetlands data is typically provided to Hillmann by Environmental Data Resources, Inc. (EDR).

2.2 Property Location/Legal Description

The Property consists of 206.8 acres of land approximately one mile west of Interstate 215, South of Garbani Road, north of Wickerd Road, and east of Evens Road in Menifee, California. The legal designation of the Property is Assessor's Parcel Numbers (APN) 360300002, 360300003, 360300004, 360300005, 360300006, 360300009, and 360350001. The latitude and longitude of the Property is approximately North 33.651948 degrees, and West 117.193607 degrees.

2.3 Significant Assumptions

The following significant assumptions are made:

- Hillmann can neither warrant nor guarantee the accuracy or completeness of the information obtained from EDR during the course of this assessment.

- Hillmann can neither warrant nor guarantee the accuracy or completeness of information that was obtained from ostensibly knowledgeable individuals, regulatory agency representatives or other secondary sources.

- Hillmann has assumed that the site operations at the time of the site visit reflect typical site conditions relative to potential environmental conditions and that no concealment of environmental conditions or releases by site owners or occupants has occurred. Likewise, Hillmann has also assumed that no areas of the Property with potential environmental concerns or RECs were concealed or otherwise not made known to us, intentionally or unknowingly, by the Property owners/occupants and/or site escort at the time of the site visit.

- For the purpose of estimating the approximate direction of groundwater flow in the absence of site specific groundwater data, unless indicated otherwise, Hillmann has assumed that the gradient of groundwater flow follows the surface topography of the Property and immediate surrounding area.

2.4 Limitations and Exceptions

2.4.1 Limiting Conditions

Hillmann was unaware of any significant limiting conditions at the time of the assessment.

2.4.2 Other Exceptions or Deletions:

No exceptions or deletions from the ASTM Standard E 1527-13 are reported.

2.5 Data Gaps

A *data gap* is defined by the ASTM as a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. A data gap is only significant if other information and/or professional experience raises reasonable concerns involving the data gap and the ability to determine the presence or absence of recognized environmental conditions.

Data Gap:	Significant (Yes/No)?	Discussion
Response to agency records requests not received as of date of report.	No	Any additional information indicative of a REC will be forwarded upon receipt.
Completed environmental questionnaire was not returned.	No	An environmental questionnaire completed by the Property representative has been requested but not yet received.

2.6 Special Terms and Conditions

Hillmann has prepared this Phase I Environmental Site Assessment using reasonable efforts in each phase of its work to identify recognized environmental conditions associated with hazardous substances, wastes and petroleum products at the Property. The methodology of this Phase I Environmental Site Assessment was consistent with the ASTM Standard Practice for E 1527-13. Findings within this report are based on information collected from observations made on the day of the site visit and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation or other construction purposes. Hillmann makes no representation or warranty that the past or current operations at the Property are, or have been, in compliance with all applicable federal, state and local laws, regulations and codes.

Findings, conclusions and recommendations presented in this report are based on our visual observations of the Property, the research findings reasonably obtained, information provided by the Client, and/or a review of readily available and supplied drawings and documents. Hillmann relies completely on the information, whether written, graphic or verbal, provided by the subject Property contact(s) or as shown on any documents reviewed or received from the subject Property contact, owner or agent, or municipal source, and assumes that information to be true and correct. Although there may have been some degree of overlap in the information provided by these various sources, Hillmann did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this assessment.

Regardless of the findings stated in this report, Hillmann is not responsible for consequences or conditions arising from facts that were concealed, withheld or not fully disclosed at the time the assessment was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Property and neighboring properties that could impact the Property. Neighboring properties listed in governmental environmental records are identified within specific search distances. The search distance varies depending upon the particular government record being checked. The regulatory research is designed to meet the requirements of ASTM Standard E 1527-13. The information provided in the regulatory database report is assumed to be correct and complete.

Subsurface conditions may differ from the conditions implied by the surface observations and can only be reliably evaluated through intrusive techniques.

Reasonable efforts have been made during this assessment to identify aboveground and underground storage tanks and ancillary equipment. "Reasonable efforts" are limited to information gained from visual observation of largely unobstructed areas, recorded database information held in public record and available information gathered from interviews. Such methods may not identify subsurface equipment that may have been hidden from view due to parked automobiles and other vehicles, snow cover, vegetative growth, pavement, construction or debris pile storage or incorrect information from sources.

Unless otherwise specified in Section 2.1 of this report, an ASTM Vapor Encroachment Screening of the Property utilizing the information collected during the course of this assessment is excluded from the scope of service for this assessment.

Hillmann is not a professional title insurance firm and makes no guarantee, explicit or implied, that the records which were reviewed represent a comprehensive or precise delineation of past Property ownership or tenancy for legal purposes.

In the event of any conflict between the terms and conditions of this report and the terms and conditions of the consulting services agreement between Richland Communities and Hillmann Consulting, the consulting services agreement shall control.

3.0 USER PROVIDED INFORMATION

3.1 Prior Environmental Reports/Documentation

Phase I Environmental Site Assessment – Golden Meadows, Menifee, California prepared by Hillmann Consulting, LLC. and dated January 25, 2013. Below is a summary of the Phase I Environmental Site Assessment:

- Based on the historic usage of the Property for crop fields, historic applications of pesticides have likely occurred at the Property. Hillmann did not identify any documented storage or usage of pesticides at the time of the assessment. Notably, Hillmann did not identify any areas of bulk storage or mixing areas for pesticides at the time of the assessment.

- Based on the historical use of the Property as crop fields, if the Property is planned for redevelopment, additional investigation would be recommended to further assess whether elevated levels of pesticide compounds exist in the surface soils at the Property.

3.2 Title Records/Environmental Liens/Activity and Use Limitations

Review of title records is not included in the scope of work for this assessment project. No information regarding environmental liens or activity and use limitations was provided to Hillmann by the Client.

3.3 Specialized Knowledge or Experience

No indication of any specialized knowledge or experience regarding the Property was reported to Hillmann by the Client.

3.4 Commonly Known or Reasonably Ascertainable Information

No commonly known or specialized knowledge of the Property was reported to Hillmann by the Client.

3.5 Property Value Reduction due to Environmental Conditions

No information was provided by the Client to Hillmann regarding a reduction of the Property value due to environmental problems or conditions.

3.6 Reason for Performing Phase I ESA

It is Hillmann's understanding that the Phase I ESA was being performed in consideration of a pending real estate transaction involving the Property.

4.0 RECORDS REVIEW

4.1 Standard Environmental Record Sources

An EDR Radius Map report was obtained from Environmental Data Resources of Shelton, CT. The EDR Radius Map Report provided a search of standard environmental record sources in general accordance with the requirements of the ASTM E1527-13. Hillmann has reviewed the EDR Radius Map report and a summary of findings is presented in the following tables and report sections. Hillmann also reviewed the list of unmapped sites (referred to by EDR as "Orphan List" sites). Unmapped sites identified as falling within an applicable specific search distance or warranting discussion in the report, if any, have been included in the information presented below. Detailed descriptions of the meaning and significance of the regulatory databases can be found in the EDR Radius Map Report in Appendix E.

Regulatory Database	Search Distance	Property Listed?	Adj. Properties Listed?	Total Listings Within Search Distance
Fed. NPL/Proposed NPL	1-mile	No	No	0
Fed. Delisted NPL	½-mile	No	No	0
Fed. CERCLIS (SEMS)	½-mile	No	No	0
Fed. CERC-NFRAP (SEMS Archive)	½-mile	No	No	0
Fed. RCRA CORRACTS	1-mile	No	No	0
Fed. RCRA TSD	½-mile	No	No	0
Fed. RCRA LQG	Site & Adj.	No	No	
Fed. RCRA SQG	Site & Adj.	No	No	
Fed. RCRA CESQG	Site & Adj.	No	No	
Fed. ENG Control List	Site	No		
Fed. INST Control List	Site	No		
Fed. ERNS	Site	No		
State/Tribal Hazardous Waste Site	1-mile	No	No	2
State/Tribal Landfill/Solid Waste	½-mile	No	No	0
State/Tribal Leaking Storage Tanks	½-mile	No	No	3
State/Tribal Registered Storage Tanks	Site & Adj.	No	No	
State/Tribal Eng. Control List	Site	No		
State/Tribal Inst. Control List	Site	No		
State/Tribal Voluntary Cleanup Sites	½-mile	No	No	0
State/Tribal Brownfields	½-mile	No	No	0
Supplemental Databases	Site & Adj.	Yes	No	

4.1.1 Property Listings

The Property was no identified in any of the reviewed databases.

4.1.2 Adjoining Property Listings

None of the adjoining properties were identified in any of the reviewed databases.

4.1.3 ASTM Search Distance Findings

The following is a summary of the findings of the regulatory database review with regard to sites identified as located within the ASTM specified search distance surrounding the Property. In order to keep this report informative and yet concise, Hillmann has provided a brief discussion of the listed site(s) for each database category that appears most likely to impact the Property based on distance, topography and/or case status. A copy of the full EDR Radius Map Report, including available details of all listed sites, is included in Appendix E.

Note that listings for the following databases, if identified, would be discussed above in Sections 4.1.1 and 4.1.2: Registered Storage Tanks, Federal RCRA Generators, Federal and State INST and ENG Controls, ERNS.

Federal NPL: No NPL listings were identified within a one-mile radius of the Property.

Federal Delisted NPL: No DNPL listings were identified within a ½-mile radius of the Property.

Federal CERCLIS: No CERCLIS listings were identified within a ½-mile radius of the Property.

Federal CERCLIS-NFRAP: No CERC-NFRAP listings were identified within a ½-mile radius of the Property.

Federal RCRA-CORRACTS: No CORRACTS listings were identified within a one-mile radius of the Property.

Federal RCRA-TSD: No TSD listings were identified within a ½-mile radius of the Property.

State/Tribal Hazardous Waste Sites: Two (2) ENVIROSTOR sites (State equivalent to CERCLIS) were identified within a one-mile radius of the Property. The sites are located north and northeast, and topographically downgradient, of the Property. Both sites are public education related, with one of the sites having identified pesticide contamination in the soils. Considering the distance, contaminants involved and topographic relation, these site are not considered to be a REC in connection with the Property.

No SHWS listings were identified within a one-mile radius of the Property on the RESPONSE database.

State/Tribal Landfill/Solid Waste Disposal Sites: No SWF/LF listings were identified within a ½-mile radius of the Property.

State/Tribal leaking Storage Tanks: Three (3) LUST listings were identified within a ½-mile radius of the Property. All three sites are topographically down-gradient or cross-gradient of the Property. Considering the distance, contaminants involved and topographic relation, these site are not considered to be a REC in connection with the Property.

No SLIC listings were identified within a ½-mile radius of the Property.

State/Tribal Voluntary Cleanup Sites: No VCP listings were identified within a ½-mile radius of the Property.

State/Tribal Brownfields: No BROWNFIELDS listings were identified within a ½-mile radius of the Property.

Review of the sites identified within the ASTM search parameters did not identify any nearby or surrounding area sites that are considered to be a REC in connection with the Property, unless as discussed otherwise previously in this section.

4.2 Additional Environmental Record Sources

4.2.1 Supplemental Database Listings

Hillmann reviewed the EDR Radius Map report for listings on supplemental databases that were searched in addition to the Standard Environmental Record Sources. Any property or adjoining property listings on such databases, if identified, would be discussed in Section 4.1.1 and 4.1.2. None of the other supplemental database listings identified by the EDR Radius Map report are considered to be a REC in connection with the Property.

4.2.2 Local Agency & Internet Research

Hillmann performed a search of available local and municipal agencies for pertinent information pertaining to the Property, particularly with regard to potential environmental concerns such as petroleum storage tanks, storage and usage of hazardous substances and petroleum products, and/or known or suspected environmental contamination. Hillmann also conducted a cursory internet search of the Property address for information indicative of a REC. The following table summarizes the findings of the research:

Source:	Inquiry Made?	Type:	Outcome:
Environmental Protection Agency (EPA)	Yes	FOIA Request	Response not received prior to issuance of report.
County of Riverside Department of Environmental Health (CUPA)	No	FOIA Request	Response not received prior to issuance of report.
Department of Toxic Substances Control (DTSC)	Yes	FOIA Request	Response indicated no records found.
Regional Water Quality Control Board (RWQCB) – Santa Ana Region (8)	Yes	FOIA Request	Response indicated no records found.
South Coast Air Quality Management District (SCAQMD)	Yes	FOIA Request	Response not received prior to issuance of report.
Riverside County Geographical Information System (GIS)	Yes	On-line search	No information indicative of a REC was identified.
CA DTSC EnviroStor database http://www.envirostor.dtsc.ca.gov/public/	Yes	Internet	The Property address was searched. No results for the Property were found.
CA GeoTracker database http://geotracker.waterboards.ca.gov/	Yes	Internet	The Property address was searched. No results for the Property were found.
USEPA Envirofacts search http://www.epa.gov/enviro/index.html	Yes	Internet	The Property address was searched. No results for the Property were found.

www.google.com	Yes	On-line search	The Property address search returns no results.
www.realquest.com	Yes	On-line search	Basic Property information such as parcel number, date of construction, and building square footages were collected. Pertinent information, where obtained, is referenced in the appropriate sections of this report.
Other:	NA		

4.3 Physical Setting Sources

4.3.1 USGS 7.5 Minute Topographic Map

The USGS 7.5 minute series topographic maps covering the Property (Romoland, CA 2012) were reviewed. The maps indicated an approximate elevation at the Property of 1,529 feet above mean sea level. The topography indicated by the map appeared to be sloping downward to the northwest. The closest down gradient body of water appeared to be an unnamed pond, approximately 2.43 miles northwest.

4.3.2 Soils

Based on USDA Soil Conservation Service (SCS) data summarized by the EDR Geocheck-Physical Setting Source Addendum, the primary soil type at the Property is classified as "Wyman." The "Wyman" designation is described as deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

4.3.3 Geology

Based on geologic data summarized by the EDR Geocheck - Physical Setting Source Addendum, the geologic formation in the vicinity of the Property is described as the plutonic and intrusive rocks of the Mesozoic Era, Cretaceous System, Cretaceous granitic rocks Series.

4.3.4 Hydrology

No site specific hydro-geologic data was available for the Property. Based on the drainage/topography of the Property and surrounding area, the inferred direction of groundwater flow appears to be towards the northwest. A detailed subsurface investigation of the Property would be needed to accurately determine site specific groundwater data such as depth, gradient and flow direction.

4.4 Historical Use – Property and Adjoining Properties

Hillmann has conducted research in order to help identify the likelihood of past uses having led to recognized environmental conditions in connection with the Property. Standard historical sources have been sought in an attempt to document the past uses of the Property as far back as it can be shown that the Property contained structures; or from the time the Property was first used for residential, agricultural, commercial, industrial or governmental purposes.

4.4.1 Fire Insurance Maps

A search of Sanborn Fire Insurance Maps for the Property and surrounding area was conducted by Environmental Data Resources, Inc. (EDR) of Shelton, Connecticut. EDR provided a Sanborn report that stated fire insurance maps covering the target property were not found.

4.4.2 City Directories

Hillman obtained an EDR City Directory Abstract report to obtain data of historic city directory listings for the Property. The City Directory Abstract report provided data from directories dated 1975 through 2012 in approximately five to six year intervals. The Property was not identified in any of the directories that were searched.

4.4.3 Historical Topographic Map Review

Hillmann obtained and reviewed an "EDR Historical Topographic Map Report" from EDR containing historic aerial photography of the Property and adjoining properties. The following interpretation of land usage was made by review of the maps:

YEAR(S)	DESCRIPTION	
1901	**Property**	The scale of the map is too large to discern specific details about the Property
	Adjacent Properties	The scale of the map is too large to discern specific details about the adjacent properties.
1942, 1943, 1947	**Property**	The Property appears to be largely undeveloped. An unimproved road is depicted on the eastern portion of the Property and three structures are depicted on the western portion along Evans Road.
	Adjacent Properties	The adjacent properties to the north, south, and west are depicted with several scattered structures. The property to the east is not depicted with any structures or roads. Evans Road, abutting the Property to the west, and Wickerd Road, abutting the Property to the south, are depicted as unimproved roads.
1953, 1973, 1979	**Property**	The Property remains largely undeveloped. An unimproved road is depicted on the western portion of the Property and three structures are depicted along Evans Road.
	Adjacent Properties	The adjacent properties to the north, south, and west are depicted with scattered structures. The property to the east is not depicted with any structures or roads. Evans Road, abutting the Property to the west, and Wickerd Road, abutting the Property to the south, are depicted as paved roads.
2012	**Property**	There is no building development depicted on the topographic map.
	Adjacent Properties	There is no building development depicted on the topographic map.

4.4.4 Aerial Photograph Review

Hillmann obtained and reviewed an "EDR Aerial Photo Decade Package Report" from EDR containing historic aerial photography of the Property and adjoining properties. In addition, Hillmann reviewed historic aerial photographs of the Property online at www.historicaerials.com and on Google Earth. The following interpretation of land usage was made by review of the aerial photographs:

YEAR(S)	DESCRIPTION	
1938	**Property**	The Property appears to be largely used for agricultural land. There is a small area of development on the western portion of the Property along Evans Road.
	Adjacent Properties	The visible portions of the adjacent properties appear to be undeveloped.
1953, 1967, 1978, 1985	**Property**	The Property appears to be largely used for agricultural land. There is a small area of development on the western portion of the Property along Evans Road.
	Adjacent Properties	The visible portions of the adjacent properties to the north, east, and west appear to be undeveloped. There are a few developed areas visible to the south that area consistent with residential properties.
1990, 2002	**Property**	The Property appears to be largely used for agricultural land. There is a small area of development on the western portion of the Property along Evans Road. Additional structures are also visible on the northeastern portion of the Property.
	Adjacent Properties	The visible portions of the adjacent properties appear to be lightly developed. The southern portion of the property to the east remains undeveloped.
2005, 2006, 2009, 2010, 2012	**Property**	The Property appears undeveloped. The areas of development appear to have been demolished.
	Adjacent Properties	The visible portions of the adjacent properties are generally developed, with the exception of the southern portion of the property to the east, which remains undeveloped.

4.4.5 Petroleum/Natural Gas Well Review

Hillmann reviewed historical record sources for evidence of historic petroleum and/or natural gas wells at the Property. In addition, Hillmann conducted a search of the property location on the Division of Oil, Gas & Geothermal Resources Well Finder database (http://maps.conservation.ca.gov/doggr/index.html). No record of any historical petroleum/natural gas wells at the Property was identified.

4.4.6 Historical Records Data Failure

Historic land use data prior to 1901 was not readily available at the time of the assessment. It is Hillmann's opinion that further investigation would not result in any significant changes to the findings of this assessment.

4.4.7 Summary of Historic Use Research

Prior to 1938 to at least 2002, the Property consisted largely of agricultural land with what appears to be a small development related to agricultural purposes on the west portion of the Property. Since at least 2005, the Property has been used as undeveloped land.

The adjoining properties to the south appear to have first been developed with residences circa 1953. The remaining adjoining properties appear to have first been developed with residences circa 1996.

5.0 SITE RECONNAISSANCE

5.1 Methodology and Limiting Conditions

The site reconnaissance consisted of visual and/or physical observations of the Property and improvements, adjoining properties as viewed from the Property boundaries and the surrounding area based on visual observations from adjacent public thoroughfares. Building exteriors were observed at ground level, unless otherwise indicated. Where applicable, Hillmann accessed and observed representative areas of building interiors to the extent they were made safely accessible with the cooperation of the site escort.

The site reconnaissance was conducted by Mr. Stephen Bartlett on August 21, 2017. Weather conditions at the time of the assessment included a temperature of approximately 80 degrees F and clear skies. Hillmann was unescorted.

During the site visit Hillmann collected twenty-four (24) soil samples and analyzed them for organochlorine pesticides (OCPs), Title 22 metals, and polycyclic aromatic hydrocarbons (PAHs). The results were below the detection level for all OCPs and PAHs analyzed. Low concentration of various metals were detected, however these were all well below the California Human Health Screening Levels (CHHSLs) as set by the DTSC.

5.1.1 Significant Inaccessible Areas

No significant areas were excluded from Hillmann's visual inspection.

5.2 General Site Setting

5.2.1 Site and Vicinity Characteristics

The Property consists of seven rectangular shaped parcels located one mile west of Interstate 215, South of Garbani Road, north of Wickerd Road, and east of Evens Road in Menifee, California. The site is currently vacant land. The total Property area is approximately 206.8 acres. The Property is located in a rural area characterized by a mixture agricultural land and single-family residences.

5.2.2 Topographic Characteristics

The terrain of the Property appeared to be relatively hilly. No natural surface bodies of water were observed.

5.2.3 General Description of Structures

The Property is not improved with any structures.

5.2.4 Sources of Heating and Cooling

There are no heating or cooling systems on the Property.

5.2.5 Potable Water Source/Sewage Disposal System

The Property is not serviced by the municipal water system, nor has a septic systems.

5.2.6 Current Use(s) of the Property

The Property is currently undeveloped.

5.2.7 Past Use(s) of the Property

No obvious indication of past Property usage likely to have involved the use, treatment, storage, disposal or generation of hazardous substances or petroleum products was observed at the time of the site visit.

5.2.8 Current Use(s) of the Adjoining Properties

The following describes adjacent and abutting properties:

Dir	Street Address	Description
N	26903 – 27155 Garbani Road	Residences
E	Vacant Land, Unassigned Address	Undeveloped land
S	Wickerd Road	Residences
W	Evans Road	Residences

No visual observations indicative of a potential environmental concern were noted on the adjoining properties.

5.2.9 Past Use(s) of the Adjoining Properties

No indication of past uses of the adjoining properties was noted at the time of the site visit. Please refer to Section 4.4 for the findings of historical site use research.

5.2.10 Current/Past Uses of Surrounding Area

The Property is located in a rural area of Menifee, California. The Property is located in a rural area characterized by a mixture agricultural land and single-family residences. No indications of past Property uses that differ substantially from current conditions were observed at the time of the site visit.

5.3 Interior & Exterior Observations

5.3.1 Storage/Usage of Hazardous Substances and Petroleum Products

No indications of the storage or usage of hazardous substances or petroleum products was identified or observed.

5.3.2 Drums

No drums were noted on the Property at the time of the site visit.

5.3.3 Other Hazardous Substances/Petroleum Products

No other containers of hazardous substances or petroleum products were noted on the Property at the time of the site visit.

5.3.4 Unidentified Substance Containers

No unidentified substance containers were noted on the Property at the time of the site visit.

5.3.5 Storage Tanks

No storage tanks were noted on the Property at the time of the site visit.

5.3.6 Polychlorinated Biphenyls (PCBs)

No PCB containing utilities were noted on the Property at the time of the site visit.

5.3.7 Odors

No unusual or pungent odors were noted on the Property at the time of the site visit.

5.3.8 Pools of Liquid

No pools of unknown liquid were noted at the Property at the time of the site visit.

5.3.9 Interior Stains or Corrosion

No interior stains or corrosion were observed at the Property at the time of the site visit.

5.3.10 Interior Drains/Sumps

No interior drains or sumps were observed at the Property at the time of the site visit.

5.3.11 Exterior Pits/Ponds/Lagoons

No evidence of any pits, ponds or lagoons were observed at the Property at the time of the site visit.

5.3.12 Stained Soil, Pavement/Stressed Vegetation

No evidence of stained soils, pavement or stressed vegetation was identified on the Property.

5.3.13 On-Site Solid Waste Dumping/Fill Material

There was evidence of some solid waste dumping along the northern boundary of the Property.

5.3.14 Wastewater

No wastewater discharges were noted on the Property.

5.3.15 Septic Systems

No evidence of a septic system(s) was observed on the Property at the time of the site visit.

5.3.16 Wells

One well was observed on the southwestern portion of the Property.

6.0 INTERVIEWS

6.1 Interviews with Past and Present Owners and Occupants

Type	Name; Affiliation/Title	Summary
Property Owner	Mr. Mike Byer, Richland Communities	Mr. Mike Byer, with Richland Communities, was provided with an environmental questionnaire with instructions to have it completed by a party knowledgeable of the Property. As of the date of this report, the environmental questionnaire has not been returned.
Property Occupants	Not applicable	Hillmann was not able to interview individual building occupants.
Past Owners, Occupants, Operators	Not applicable	Past owners/occupants of the Property were not available for interview at the time of the assessment.
Owners/Occupants of Adjacent or Nearby Properties	Not applicable	The Property was not an abandoned property with evidence of unauthorized uses or uncontrolled access; therefore, interviews with adjacent or nearby property owners or occupants were not conducted.

6.2 Interviews with State and/or Local Government Officials

Written and on-line requests for environmental records of the Property from State and Local governmental agencies are detailed in Section 4.2.2.

7.0 NON-ASTM SCOPE CONCERNS

In accordance with our contract agreement, Hillmann has conducted preliminary evaluations of the following "Non-ASTM Scope Considerations" that are outside of the requirements of the ASTM E1527-13 standard:

7.1 Asbestos-Containing Material (ACM)

There are no permanent buildings on the Property. Therefore, a screening for asbestos is not applicable to this assessment.

7.2 Lead-Based Paint

There are no permanent buildings on the Property. Therefore, a screening for lead-based paint is not applicable to this assessment.

7.3 Radon

According to data compiled by the USEPA, as summarized by the EDR Radius Map Report with GeoCheck, the Property is located in an area with a moderate potential for radon concentrations that exceed current USEPA action guidelines. The County of Riverside is classified as a Zone 2 or 'moderate risk' area for radon. Accordingly, radon is unlikely to represent an environmental concern to the Property.

7.4 Mold

There are no permanent buildings on the Property. Therefore, a screening for mold is not applicable to this assessment.

7.5 Wetlands

Based on a review of the EDR Radius Map Report with GeoCheck, no NWI mapped wetlands were indicated at the Property.

It is emphasized that the absence of NWI mapped wetland areas indicated by the EDR report does not necessarily rule out the potential presence of regulated wetland areas on or immediately adjoining the Property. A wetland delineation should be sought from a qualified firm if a more comprehensive determination regarding the presence or absence of wetlands on or adjacent to the Property is warranted.

8.0 ENVIRONMENTAL PROFESSIONAL STATEMENT

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312. I have the specific qualifications based on education, training and experience to assess a *property* of the nature, history and setting of the subject *property*. Hillmann has developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

_____

Christopher W. Baker
Environmental Professional

9.0 REFERENCES

EDR Aerial Photo Decade Package, Environmental Data Resources, 2017

EDR City Directory Abstract Report, Environmental Data Resources, 2017

EDR Historical Topographic Map Report, Environmental Data Resources, 2017

EDR Radius Map Report with GeoCheck, Environmental Data Resources, 2017

EDR Sanborn Map Report, Environmental Data Resources, 2017

www.realquest.com

San Bernardino County's On-line Geographical Information System

Phase I Environmental Site Assessment – Golden Meadows, Menifee, California, Hillmann Consulting, LLC., January 25, 2013.

10.0 APPENDICES

Appendix A	Site Diagram / Vicinity Map
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Appendix D	Historical Records Documentation
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Appendix G	Project Personnel Qualifications

APPENDIX A

SITE DIAGRAM / VICINITY MAP

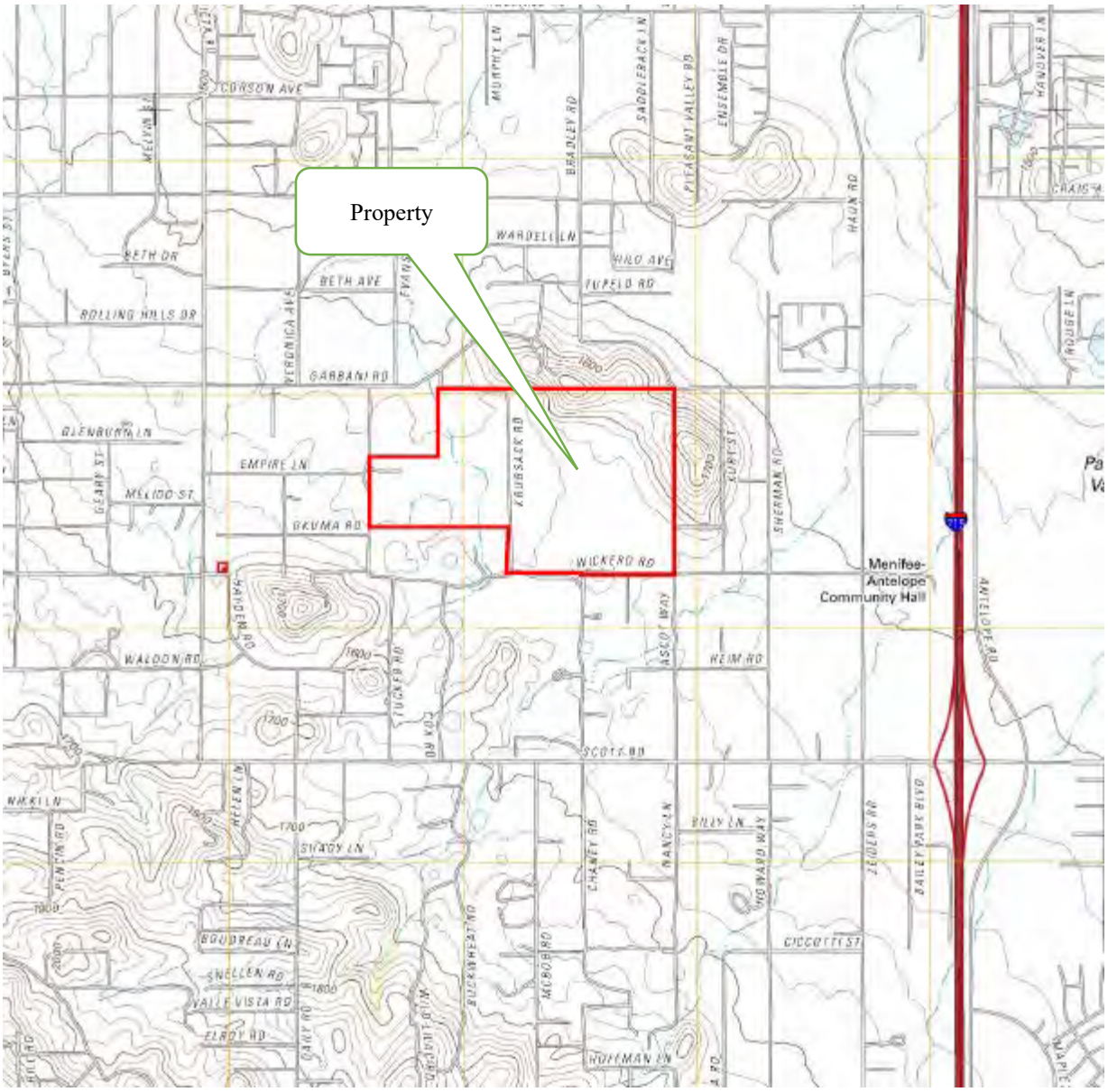

Figure 1: SITE VICINITY MAP	SCALE: (Not to Scale)	N

HILLMANN CONSULTING

Project Location:	Golden Meadows Menifee, CA 92584
Project No.:	C3-6927

Figure 2: SITE DIAGRAM	SCALE: (Not to Scale)	N

HILLMANN CONSULTING

Project Location:	Golden Meadows Menifee, CA 92584
Project No.:	C3-6927

APPENDIX B

SITE PHOTOGRAPHS

PHOTO LOG
Golden Meadows
Menifee, California 92584
C3-6927

View of adjoining properties to the north

View of adjoining properties to the west

View of adjoining properties to the south

View of Property facing south

View of nuisance dumping on north side of Property

View of Property facing west

PHOTO LOG
Golden Meadows
Menifee, California 92584
C3-6927

View of eastern portion of Property

View of Property facing east

View of the central portion of the Property

View of well on Property

View of Property facing north

View of Property facing north

APPENDIX C

QUESTIONNAIRES/USER PROVIDED INFORMATION

HILLMANN
CONSULTING

PHASE I ENVIRONMENTAL SITE ASSESSMENT

Golden Meadows
Menifee, California

Prepared For:

Richland Communities Inc.
4100 Newport Place, Suite 800
Newport Beach, CA92660

Hillmann Project Number C3-5484

January 25, 2013

Your Property. Our Priority.
1745 W. Orangewood Avenue, Suite 110, Orange, CA 92868
Telephone (714) 634-9500 Fax: (714) 634-9507 Toll free: (800) 232-4326
www.HillmannConsulting.com

HILLMANN
CONSULTING

January 25, 2013

Mr. Mike Byer
Richland Communities Inc.
4100 Newport Place, Suite 800
Newport Beach, CA92660

RE: Phase I Environmental Site Assessment
Golden Meadows
Menifee, California
Hillmann Project Number: C3-5484

Hillmann Consulting, LLC, is pleased to provide the results of our Phase I Environmental Site Assessment of the above referenced property. This assessment was performed in accordance with the scope and limitations of ASTM Practice E 1527-05.

This report is for the exclusive use of the entities named on the front cover, its affiliates, designates and assignees, rating agencies, prospective bond holders and bond holders, and no other party shall have any right to rely on any service provided by Hillmann Consulting, LLC, without prior written consent.

We appreciate the opportunity to provide environmental due diligence services. If you have any questions concerning this report, or if we can assist you in any other matter, please contact the Project Manager at 714-634-9500.

Very Truly Yours,
Hillmann Consulting, LLC

Kenneth A. Thornburgh, Ph.D.
Project Manager

David Rutherford
Director of Due Diligence

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1.0 EXECUTIVE SUMMARY

At the request of Richland Communities, Hillmann Consulting, LLC (Hillmann) performed a Phase I Environmental Site Assessment (ESA) of 206 acres of land located less than one mile west of the Interstate 215, south of Garbani Road, north of Wickerd Road, and east of Evens Road in Menifee, California (the Property). This assessment has been conducted utilizing generally accepted Phase I ESA industry standards in accordance with the ASTM Standard Practice E 1527-05 for Phase I Environmental Site Assessments.

1.1 Property Summary Table

A summary of the pertinent details of the project is provided below:

PROJECT SUMMARY TABLE						
Name of Client		Richland Communities				
Client Project No.:		Tract No. 31194				
Client Contact:		Mr. Mike Byer				
Description of Project		Phase I Environmental Site Assessment				
Property Name:		Golden Meadows				
Property Address:		N/A				
City:	Menifee	**County:**	Riverside	**State:**	CA	
Tax Map designation:		**APN**:	360300002, 360300003, 360300004, 360300005, 360300006, 360300009, 360350001			
Property Area:	206.8 acres					
Building Area:	N/A					
Assessor Designated Site Use:	Residential					
Year Built:	Vacant land					
Property Owner:	50% Golden Hill Country, LLC, 50% Golden Meadowland, LLC					
Assessment Personnel:	Mr. Kenneth A. Thornburgh					
Accompanied/Escorted By:	Unescorted					
Property Contact:	Mr. Mike Byer					
Inspection Date:	January 14, 2012					
Weather Conditions:	Clear, 75 degrees F					

1.2 Summary of Findings

The following table summarizes the individual sections of this assessment. This table, alone, does not constitute the complete assessment. The report must be reviewed in its entirety.

FINDINGS SUMMARY					
ASSESSMENT SECTION	ACCEPTABLE	O&M RECOM'D	REC	FURTHER ACTION/ PHASE II RECOM'D	REF. SECTION
Historical Review			X	X	5.0
Regulatory Review	X				8.0
Site Use	X				3.3/6.2
Hazardous Materials	X				6.3
USTs	X				6.6
ASTs	X				6.6
PCBs	X				6.7
Waste / Discharges	X				6.4/6.5
ACM	X				7.1
Lead Paint	X				7.2
Drinking Water	X				6.11
Radon	X				7.3
Mold	X				7.4
Adjoining/Surrounding Area	X				3.6/3.7/8.2

1.3 Conclusions

Hillmann has performed a Phase I Environmental Site Assessment in accordance with the scope and limitations of ASTM Practice E 1527-05 of the Property as described in Section 2 of this report. Any additions to, exceptions to, or deletions from this practice are also described in Section 2 of this report. This assessment has revealed no evidence of *recognized environmental conditions* in connection with the Property, except the following:

- Based on the historic usage of the Property for crop fields, historic applications of pesticides have likely occurred at the Property. Hillmann did not identify any documented storage or usage of pesticides at the time of the assessment. Notably, Hillmann did not identify any areas of bulk storage or mixing areas for pesticides at the time of the assessment.

Hillmann has also performed cursory evaluations for ASTM "Non-Scope" items, such as asbestos-containing materials (ACM), lead-based paint, radon and mold. Our observations and research did not identify any potential concerns.

1.4 Recommendations

Based on information collected from the site investigation, record reviews, interviews and site reconnaissance, the following recommendations are made:

- Based on the historical use of the Property as crop fields, if the Property is planned for redevelopment, additional investigation would be recommended to further assess whether elevated levels of pesticide compounds exist in the surface soils at the Property.

2.0 PURPOSE AND LIMITATIONS

2.1 Purpose and Scope

This assessment was conducted utilizing generally accepted Phase I ESA industry standards in accordance with the ASTM Standard Practice E 1527-05. The ASTM describes these methodologies as representing good commercial and customary practice for conducting an Environmental Site Assessment of a property for the purpose of identifying recognized environmental conditions.

The term *recognized environmental conditions (RECs)* is defined by the ASTM as the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not *REC*s.

The chief components of this assessment are described as follows:

- Review and discussion of current Property conditions regarding the presence or absence of hazardous chemicals/petroleum products; generation, treatment, storage or disposal of hazardous, regulated or medical wastes; electrical equipment that utilizes oils which potentially contain PCBs; and bulk storage tanks (above or below ground).

- Review and discussion of the usage of adjacent and nearby properties to identify the potential for contamination (if present and/or suspected) to migrate onto the Property.

- Summary of physical characteristics of the Property through a review of available topographic, geologic and groundwater data.

- Research of the historic uses of the Property through a review of reasonably ascertainable standard sources, such as fire insurance maps, city directories, aerial photographs, prior reports and interviews.

- A regulatory review of federal and state environmental databases, and other local environmental records, within specific search distances defined by the ASTM.

These methodologies are described as representing good commercial and customary practice for conducting an Environmental Site Assessment of a property for the purpose of identifying recognized environmental conditions.

A cursory evaluation for the following "Non-ASTM" concerns, such as the following:

- ♦ Suspect Asbestos-containing Materials

- Lead-based Paint
- USEPA Designated Radon Potential
- Mold

2.2 Inaccessible Locations

No notable areas of the Property were excluded from our visual inspection.

2.3 Limitations and Exceptions

Historic research data gaps are detailed in Section 5, if applicable. No other exceptions or deletions from the ASTM Standard E 1527-05 are reported.

2.4 Abbreviations/Acronyms

Hillmann may use the following abbreviations and acronyms for common terminology described in our report. Not all abbreviations or acronyms may be applicable to this report:

ACM – Asbestos-containing Material
AST – Aboveground Storage Tank
ASTM – American Standard for Testing Materials
FOIA – Freedom of Information Act
HVAC – Heating Ventilation & Air Conditioning
HREC – Historic Recognized Environmental Condition
IAQ – Indoor Air Quality
LBP – Lead-based Paint
LUST – Leaking Underground Storage Tank
MSDS – Material Safety Data Sheet
REC – Recognized Environmental Condition
UST – Underground Storage Tank

2.5 Special Terms and Conditions

Hillmann has prepared this Phase I Environmental Site Assessment using reasonable efforts in each phase of its work to identify recognized environmental conditions associated with hazardous substances, wastes and petroleum products at the Property. The methodology of this Phase I Environmental Site Assessment was consistent with the ASTM Standard Practice for E 1527-05. Findings within this report are based on information collected from observations made on the day of the site investigation and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation or other construction purposes. Hillmann makes no representation or warranty that the past or current operations at the Property are, or have been, in compliance with all applicable federal, state and local laws, regulations and codes.

Findings, conclusions and recommendations presented in this report are based on our visual observations of the Property, the municipal research findings reasonably obtained, information provided by the Client, and/or a review of readily available and supplied drawings and documents. Hillmann relies completely on the information, whether written, graphic or verbal, provided by the subject Property contact(s) or as shown on any documents reviewed or received from the subject Property contact, owner or agent, or municipal source, and assumes that information to be true and correct. Although there may have been some degree of overlap in the information provided by these various sources, Hillmann did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this assessment.

Regardless of the findings stated in this report, Hillmann is not responsible for consequences or conditions arising from facts that were concealed, withheld or not fully disclosed at the time the assessment was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The report focuses on the Property and neighboring properties that could impact the Property. Neighboring properties listed in governmental environmental records are identified within specific search distances. The search distance varies depending upon the particular government record being checked. The regulatory research is designed to meet the requirements of ASTM Standard E 1527-05. The information provided in the regulatory database report is assumed to be correct and complete.

Subsurface conditions may differ from the conditions implied by the surface observations and can only be reliably evaluated through intrusive techniques.

Reasonable efforts have been made during this assessment to identify aboveground and underground storage tanks and ancillary equipment. “Reasonable efforts” are limited to information gained from visual observation of largely unobstructed areas, recorded database information held in public record and available information gathered from interviews. Such methods may not identify subsurface equipment that may have been hidden from view due to parked automobiles and other vehicles, snow cover, vegetative growth, pavement, construction or debris pile storage or incorrect information from sources.

Hillmann is not a professional title insurance firm and makes no guarantee, explicit or implied, that the records which were reviewed represent a comprehensive or precise delineation of past Property ownership or tenancy for legal purposes.

3.0 PROPERTY DESCRIPTION

3.1 Property Location

The Property is located less than one mile west of the Interstate 215, south of Garbani Road, north of Wickerd Road, and east of Evens Road in Menifee, California. The legal designation of the Property is APN 360300002, 360300003, 360300004, 360300005, 360300006, 360300009, and 360350001. The latitude and longitude of the Property is approximately north 33.6526 degrees, and west 117.1900 degrees.

3.2 Site and Vicinity Characteristics

The Property consists of a 206.8 acre tract of undeveloped vacant land located less than one mile west of the Interstate 215, south of Garbani Road, north of Wickerd Road, and east of Evans Road in Menifee, California. The Property abuts a vacant plot of land along Garbani Road. There is no existing entry into the Property other than dirt paths for farm equipment. The Property consists of flat and gently rolling fields. Some of the fields are utilized for farming and have been recently plowed. A well is located on the Property. A middle school is located adjacent to the site across Evans Road at the corner of Evans Road and Garbani Road. The surrounding land to the east, south, and west consists of farm land and small horse ranches. A sub division of single family houses is located north across Garbani Road.

3.3 Current Use of the Property

The Property is currently utilized as farm land and/or open fields.

3.4 Description of Property Improvements

The Property consists of undeveloped land. A portion of the tract is utilized as farm land and had been recently tilled at the time of the site visit.

3.5 Utilities/Source of Heating

The site has no existing structures. No utility improvements were observed on the site at the time of the site assessment. A records search indicates that no utility services have ever been provided to the site as no utility records were found.

3.6 Current Uses of the Adjoining Properties

The following describes adjacent and abutting properties to the Property:

DIRECTION	DESCRIPTION
North	Sub division of single family houses
East	Undeveloped land
South	Farms & horse ranches
West	Farms & horse ranches

No visual evidence of any impacts from the adjoining properties was observed.

3.7 Surrounding Area

The vicinity of the Property in Menifee, California is characterized by a mix of residential and farm properties.

3.8 Physical Setting

3.8.1 Topography

According to the United States Geological Survey (USGS) 7.5-Minute Series Topographic Map, Romoland, CA Quadrangle (1979), the Property is located at approximately 1,539 feet above mean sea level. The topographic gradient at the Property is slopes in a general south-southwest direction. Copies of the topographic maps are included in Appendix C.

3.8.2 Soils

Based on the United States Department of Agriculture - Soil Conservation Service data, soils at the Property are classified as "Wyman". This soil has a texture of loam and is well drained with moderate infiltration rates.

3.8.3 Geology

According to the EDR Geo-Check report, the bedrock geologic formation in the area within the vicinity of the Property is identified to be Plutonic and Intrusive Rocks of the Mesozoic Era.

3.8.4 Hydrology

Based on the drainage/topography, groundwater is estimated to flow to the north-northeast. Groundwater levels and/or flow direction(s) may vary due to seasonal fluctuations in precipitation, local usage demands, geology, underground structures or dewatering operations.

Based on the U.S. Fish & Wildlife Service's National Wetlands Inventory, wetlands are not suspected to be present on the Property.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) covering the area of the Property, the Property is located outside of the 100 and 500 year flood zones.

4.0 USER PROVIDED INFORMATION

4.1 Title Records/Environmental Liens/Activity and Use Limitations

Review of title records is not included in the scope of work for this assessment project. No information regarding environmental liens or activity and use limitations was provided to Hillmann by the Client.

4.2 Specialized Knowledge or Experience

No indication of any specialized knowledge or experience regarding the Property was reported to Hillmann by the Client.

4.3 Commonly Known or Reasonably Ascertainable Information

No commonly known or specialized knowledge of the Property was reported to Hillmann by the Client.

4.4 Property Value Reduction due to Environmental Conditions

No information was provided by the Client to Hillmann regarding a reduction of the Property value due to environmental problems or conditions.

4.5 Reason for Performing Phase I ESA

It is Hillmann's understanding that the Phase I ESA was being performed in conjunction with a pending real estate or bank financing transaction involving the Property.

5.0 HISTORICAL USE RESEARCH

5.1 Sanborn Fire Insurance Maps

Fire insurance maps were created for insurance underwriters and often contain information regarding the uses of individual structures, and the locations of fuel and/or chemical storage tanks that may have been on a particular property. These maps were generally prepared for urban areas beginning in the middle to late 1880s and continuing generally into the 2000s.

A search of Sanborn Fire Insurance Maps for the Property and surrounding area was conducted by Environmental Data Resources, Inc. (EDR) of Milford, Connecticut. EDR provided a report that stating fire insurance maps covering the Property were not found.

5.2 Historic City Directories

A search of City Directories for the Property and surrounding area was conducted by EDR. The City Directory Abstract report provided data from directories dated 1975 through 201 in approximately five to six year intervals. The Property was not identified in any of the directories that were searched.

5.3 Historical Topographic Map Review

A search of historical topographic maps for the Property was conducted by EDR. Topographic maps of the Property and vicinity for the years 1901, 1947, 1953, 1973, and 1979 were provided for review. The following pertinent details were obtained from review of the topographic maps:

YEAR(S)	DESCRIPTION	
1901	**Property**	The scale of the map is too large to discern specific details about the Property
	Adjacent Properties	The scale of the map is too large to discern specific details about the adjacent properties.
1947	**Property**	The Property appears to be largely undeveloped. An unimproved road is depicted on the eastern portion of the Property and three structures are depicted on the western portion along Evans Road.
	Adjacent Properties	The adjacent properties to the north, south, and west are depicted with several scattered structures. The property to the east is not depicted with any structures or roads. Evans Road, abutting the Property to the west, and Wickerd Road, abutting the Property to the south, are depicted as unimproved roads.
1953, 1973, 1979	**Property**	The Property remains largely undeveloped. An unimproved road is depicted on the western portion of the Property and three structures are depicted along Evans Road.
	Adjacent Properties	The adjacent properties to the north, south, and west are depicted with scattered structures. The property to the east is not depicted with any structures or roads. Evans Road, abutting the Property to the west, and Wickerd Road, abutting the Property to the south, are depicted as paved roads.

5.4 Aerial Photograph Review

A search of Aerial Photographs for the Property and surrounding area was conducted by EDR. EDR provided an Aerial Photography report of several historic photographs of the Property area from the years 1938, 1953, 1967, 1976, 1990, 2002, 2005 and 2006. The following pertinent details were obtained from review of the report:

YEAR(S)	DESCRIPTION	
1938	**Property**	The Property appears to be largely used for agricultural land. There is a small area of development on the western portion of the Property along Evans Road.
	Adjacent Properties	The visible portions of the adjacent properties appear to be undeveloped.
1953, 1967, 1976	**Property**	The Property appears to be largely used for agricultural land. There is a small area of development on the western portion of the Property along Evans Road.
	Adjacent Properties	The visible portions of the adjacent properties to the north, east, and west appear to be undeveloped. There are a few developed areas visible to the south that area consistent with residential properties.
1990, 2002	**Property**	The Property appears to be largely used for agricultural land. There is a small area of development on the western portion of the Property along Evans Road. Additional structures are also visible on the northeastern portion of the Property.
	Adjacent Properties	The visible portions of the adjacent properties appear to be lightly developed. The southern portion of the property to the east remains undeveloped.
2005, 2006	**Property**	The Property appears undeveloped. The areas of development appear to have been demolished.
	Adjacent Properties	The visible portions of the adjacent properties are generally developed, with the exception of the southern portion of the property to the east, which remains undeveloped.

5.5 Prior Investigation Reports

No prior investigation reports for the Property were provided to Hillmann.

5.6 Interviews

Mr. Mike Byer (Richland Investments) was not aware of any historical environmental concerns associated with the Property. He also filled out a pre-survey questionnaire regarding site specific environmental information.

According to Tax Assessor's and Building Department no building permits exist for the Property and no records are available.

5.7 Summary and Conclusion of Historic Use Research

Prior to 1938 to at least 2002, the Property consisted largely of agricultural land with what appears to be a small development related to agricultural purposes on the west portion of the Property. Since at least 2005, the Property has been used as undeveloped land.

5.8 Data Gaps

Historic land use data prior to 1901 was not readily available at the time of the assessment. It is Hillmann's opinion that further investigation would not result in any significant changes to the findings of this assessment.

6.0 SITE RECONNAISSANCE/INTERVIEWS

6.1 Interviews

Hillmann was unaccompanied during the onsite assessment. Any pertinent information obtained is referenced in the appropriate sections of this report.

6.2 Property Use

The Property is occupied by undeveloped land.

6.3 Hazardous Substance/Petroleum Products Storage/Handling

No storage of hazardous substances or petroleum products was identified on the Property. No evidence of any spills or releases was observed during the site reconnaissance.

6.4 Waste Generation, Storage and Disposal

No evidence of improper or illegal waste disposal was observed visually during the site reconnaissance. No evidence of hazardous waste generation or disposal was identified at the Property.

6.5 Waste Discharges

The Property does not have a sewer system located on-site. No industrial or process waste discharges were identified at the Property.

6.6 Underground/Above Ground Storage Tanks

No evidence of any active or inactive underground ground storage tanks (USTs) was noted at the Property. The Property was not listed on the LUST regulatory databases.

6.7 Polychlorinated Biphenyls (PCBs)

No power transformers were located on the Property.

6.8 Drains/Sumps

No interior floor drains or sumps were noted at the Property.

6.9 Exterior Pits/Ponds/Lagoons

No evidence of exterior pits, ponds or lagoons was identified on the Property in connection with waste treatment or disposal

6.10 Stained Soil, Pavement/Stressed Vegetation

No evidence of stained soils or stressed vegetation was identified on the Property.

6.11 Drinking Water/Wells/Septic Systems

Potable water is not provided to the Property. A well was observed on the site. No evidence of septic systems were identified at the Property.

7.0 NON-ASTM SCOPE CONCERNS

7.1 Asbestos-Containing Material (ACM)

The Property consists of undeveloped land. Therefore, a screening for suspected ACM is not applicable to this assessment.

7.2 Lead-Based Paint

The Property consists of undeveloped land. Therefore, a screening for the presence of lead based paint is not applicable to this assessment.

7.3 Radon

Radon is a naturally occurring, colorless, odorless gas that is a byproduct of the decay of radioactive materials potentially present in bedrock and soil. Radon gas may enter the lowest level of a building through floor cracks, structural joints or plumbing conduits. The United States Environmental Protection Agency (USEPA) guidance level for annual residential exposure to radon is 4.0 picocuries per liter of air (pCi/L). The guidance level is not a regulatory requirement for private owners of commercial real estate, but is commonly used for comparison purposes to suggest whether further action at a building may be prudent.

Based on information obtained from data obtained by the USEPA, the Property is located in an area with a moderate potential for radon concentrations that exceed current USEPA action guidelines. The County of Riverside is classified as Zone 2, or 'moderate risk' area for radon.

7.4 Mold

The property consists of undeveloped land. Therefore, a cursory screening for evidence of excessive or amplified mold growth, or for conditions favorable for mold growth, was not applicable to this assessment.

8.0 REGULATORY RECORD REVIEWS

A search of environmental regulatory databases, by service from Environmental Data Resources of Milford, CT, was conducted in accordance with the requirements of the ASTM. Hillmann also reviewed the "unmappable" listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Property based on the partial street address, city name or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary that were identified by Hillmann as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

REGULATORY DATABASE	SEARCH DISTANCE	ON-SITE LISTINGS	ADJ. PROPERTY LISTINGS	TOTAL WITHIN SEARCH DISTANCE
Fed. NPL	1-mile	0	0	0
Fed. Delisted NPL	½-mile	0	0	0
Fed. CERCLIS	½-mile	0	0	0
Fed. CERCLIS-NFRAP	½-mile	0	0	0
Fed. RCRA CORRACTS	1-mile	0	0	0
Fed. RCRA TSD	½-mile	0	0	0
Fed. RCRA LQG & SQG (Generators)	Site & Adj.	0	0	
Fed. ERNS	Site	0		
State & Tribal SHWS equiv. NPL & CERCLIS	1-mile	0	0	0
State & Tribal SWF/LF	½-mile	0	0	0
State & Tribal LUST	½-mile	0	0	1
State & Tribal Registered Stor. Tank	Site & Adj.	0	0	
State & Tribal ENG. Control List	½-mile	0	0	0
State & Tribal INST. Control List (AUL)	½-mile	0	0	0
State & Tribal VCP	½-mile	0	0	0
State & Tribal Eng. Brownfields (BF)	½-mile	0	0	0
Spills	Site	0		

- *The results of the review for each database are discussed below. The locations for the facilities discussed in this section are shown on the figures in the EDR report, included as Appendix E.*

- *According to the EPA Policy Toward Owners of Property Containing Contaminated Aquifers, dated July 3, 1995, the EPA will not take enforcement action against a property owner who owns property under which is an aquifer contaminated by subsurface migration from an off-site source or sources. Therefore, the Subject Property owner would not be liable for any contamination of the underlying aquifer that was attributed to an off-site source.*

8.1 On-Site Database Listings

The Property was not identified on the regulatory databases searched.

8.2 Adjoining Property Database Listings

No adjoining properties were identified on the regulatory databases searched.

8.3 Federal Agency Record Review

EPA - The National Priorities List (NPL), also known as the Superfund list, is the United States Environmental Protection Agency (EPA) listing of uncontrolled or abandoned hazardous waste sites. These sites are targeted for possible long-term remedial action under the Superfund Act of 1980. The list is primarily based on the EPA's Hazardous Ranking System.

- No NPL listings were identified within a one-mile radius of the subject property.

EPA – Delisted NPL Site List (DNPL) provides a list of sites formerly listed on the NPL that have since been "de-listed" after the EPA has determined that no further response is appropriate.

- No DNPL listings were identified within a ½-mile radius of the Property.

EPA - The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) is the EPA database of known or suspected uncontrolled or abandoned hazardous waste sites. These sites have either been investigated, or are currently under investigation by the EPA for the release or threatened release of hazardous substances.

- No CERCLIS listings were identified within a ½-mile radius of the Property.

EPA – CERCLIS-NFRAP (No Further Remedial Action Planned) is the EPA database of archived sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that the EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time.

- No CERCLIS-NFRAP listings were identified within a ½-mile radius of the Property.

EPA - The Resource Conservation and Recovery Information System (RCRIS) is a database of facilities, which generate or treat, store or dispose of EPA regulated hazardous waste, or meet other applicable requirements of the Resource Conservation and Recovery Act (RCRA). Inclusion on this database does not imply that mishandling or a release of hazardous waste has occurred at the facility. RCRIS categories are as follows:

Corrective Action (CORRACTS) list is a list of hazardous waste treatment, storage or disposal facilities and other RCRIS facilities (due to past interim status or storage of hazardous waste

beyond 90 days) that have been notified by the US EPA to undertake corrective action under RCRA.

- No CORRACTS listings were identified within a one-mile radius of the subject Property.

Treatment, Storage, and Disposal Facilities (TSD). Facilities listed under TSD are sites that treat, store, and/or dispose of EPA regulated hazardous waste.

- No TSD listings were identified within a ½-mile radius of the Property.

Large Quantity Generators (LQG). Facilities listed under LQG either generate more than 1000 Kilograms (kg) of EPA regulated hazardous waste per month, or meet other applicable requirements of RCRA.

- No adjoining properties were identified on the LQG database.

Small Quantity Generators (SQG). Facilities listed under SQG either generate from 100 kilograms (kg) to 1000 kg of EPA regulated hazardous waste per month, or meet other applicable requirements of RCRA.

- No adjoining properties were identified on the SQG database.

EPA - The Emergency Response Notification System (ERNS) is a national database used to store information concerning the sudden and/or accidental release of hazardous substances, including petroleum in quantities greater than the reportable quantity, as maintained at the National Response Center. The database contains preliminary information from spill reports made to various federal departments including the EPA.

- No listings were identified for the Property.

8.4 State Agency Record Review

State Hazardous Waste Sites (SHWS) database contains potential or confirmed hazardous substance release properties.

- No SHWS listings were identified within a one-mile radius of the Property.

Solid Waste Facility/Landfill (SWF/LF) list provides information on the location of registered state landfills and associated transfer facilities.

- No SWF/LF listings were identified within a ½-mile radius of the subject Property.

Leaking Underground Storage Tanks (LUST) is a comprehensive listing of all reported active and inactive leaking storage tank sites.

- One (1) LUST listing was identified within a ½-mile radius of the Property. The site was listed as Menifee Union School District located at 26301 Garbani Road. This site is

approximately 1,391 feet west-northwest and cross-gradient of the subject Property. The listing states that the site received a "Completed - Cased closed" status in 2003. Considering the distance, status, and topographical relation to the Property, this site is not considered to be a recognized environmental condition in connection with the Property.

Registered Storage Tank Database is the listing of registered storage tank sites. This includes the UST database.

- The Property and adjoining properties were not identified on the UST database.

Engineering Controls Site Listing (ENG Controls) list provides information on the location of remediation sites using engineering controls as part of the response action. Engineering controls include various forms of caps, building foundations, liners and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

- No ENG Controls listings were identified within a ½-mile radius of the subject Property.

Institutional Controls Site Listing (INST Controls) list provides information on the location of remediation sites using institutional controls as part of the response action. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions and post remediation care requirements intended to prevent exposure to contaminants remaining on-site. Deed restrictions are generally required as part of the institutional controls

- No INST Controls listings were identified within a ½-mile radius of the Property.

Voluntary Cleanup Program (VCP) and **Independent Cleanup Report (ICR)** lists provide information on the location of sites involved in a Voluntary Cleanup or similar program. Under a Voluntary Cleanup Program, a property owner will voluntarily enter into an agreement with a state or local environmental regulatory agency to conduct an investigation and remediation for specific area(s) of concern.

- No VCP or ICR sites were identified within a ½-mile radius of the Property.

Brownfields (BF) list provides information on the location of sites involved in a state or local Brownfields program.

- No Brownfield listings were identified within a ½-mile radius of the Property.

Review of the remaining sites identified within the ASTM search parameters did not identify any site that is considered to be a REC in connection with the Property.

8.5 Local Government Agencies

City of Menifee

Building Department

Hillmann contacted the City of Menifee Building Department to review building permits on file for the Property's address. According to the representative, no building permits were . Found for the Property.

Riverside County

Tax Assessor's Office

Property information was researched at the Riverside County Tax Assessor's Office in Riverside, California during the site assessment. The current Assessor's Parcel Numbers (APN) for the Property are 360300002, 360300003, 360300004, 360300005, 360300006, 360300009, 360350001. According to Tax Assessor's records, the current Property building owner is 50% Golden Hill Country, LLC, 50% Golden Meadowland, LLC.

Riverside County Fire Department

Hillmann contacted the Riverside County Fire Department in order to determine if any UST or hazardous materials records were on file for the Property. As of the date of this report, no response has been received by the agency.

Riverside County Department of Environmental Health

Hillmann contacted the Riverside County Department of Environmental Health in order to determine if any UST or hazardous materials records were on file for the Property. As of the date of this report, no response has been received by the agency.

State of California

South County Air Quality Management District

Hillmann contacted the South County Air Quality Management District (SCAQMD) in order to determine if there are any environmental files on record for the Property. As of the date of this report, no response has been received by the agency.

Department of Toxic Substances Control – Cypress Regional Office

Hillmann contacted the State of California Department of Toxic Substances Control (DTSC) in order to determine if any records were on file for the property's address. To date no response has been received by the agency.

Regional Water Quality Control Board – Santa Ana and San Diego Regions

Hillmann contacted the State of California Regional Water Quality Control Board (RWQCB) in order to determine if any records of underground storage tanks (USTs) or groundwater

contamination were on file for the Property. As of the date of this report, no response has been received by the agency.

9.0 ENVIRONMENTAL PROFESSIONAL STATEMENT

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312. I have the specific qualifications based on education, training and experience to assess a *property* of the nature, history and setting of the subject Property. Hillmann has developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

David Rutherford
Environmental Professional

10.0 REFERENCES

EDR City Directory Abstract Report, Environmental Data Resources, 2013

EDR Radius Map Report with GeoCheck, Environmental Data Resources, 2013

EDR Sanborn Map Report, Environmental Data Resources, 2013

EDR Historical Topographic Map Report, Environmental Data Resources, 2013

EDR Aerial Photography Print Service, Environmental Data Resources, 2013

11.0 APPENDICES

Appendix A	Site Photographs
Appendix B	Maps/Diagrams
Appendix C	Historical Land Use Documentation/Maps
Appendix D	Reference Documents / Laboratory Results (if applicable)
Appendix E	Regulatory Database Report

APPENDIX A

SITE PHOTOGRAPHS

PHOTO LOG
Golden Meadows
Menifee, CA
C3-5484

1. Viewing east along Garbani Rd.

3. Viewing north along Evans Rd.

2. Viewing south along Evans Rd.

4. Viewing north from Property (vacant field)

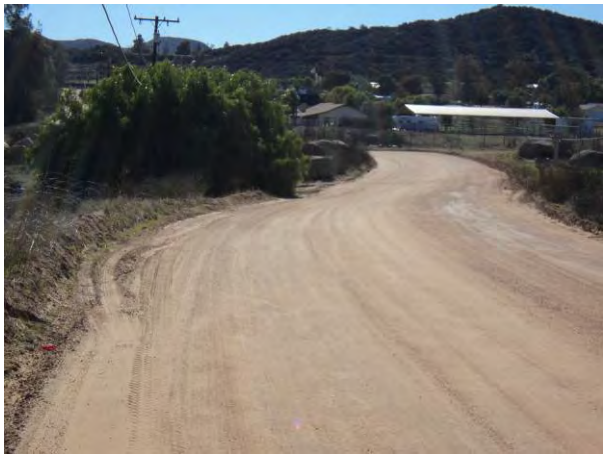
5. View of northern edge of Property

6. View of Property from center of site

PHOTO LOG
Golden Meadows
Menifee, CA
C3-5484

7. Viewing Property from west

8. View of Property from Evans Rd. near Wickert Rd.


9. Viewing Property along Wickert Rd.

10. View of Property from Wickert Rd.

11. Vacant field abutting Property to the north

12. Well on Property (along Evans Rd. near Wickert Rd.)

PHOTO LOG
Golden Meadows
Menifee, CA
C3-5484

13. Viewing Property along Wickert Rd.

14. Intersection of Evans Rd. and Wickert Rd. (near southeastern corner of Property)

15. Interior of Property

16. Corner of Garbani Rd. and Evans Rd.

APPENDIX B

MAPS/DIAGRAMS

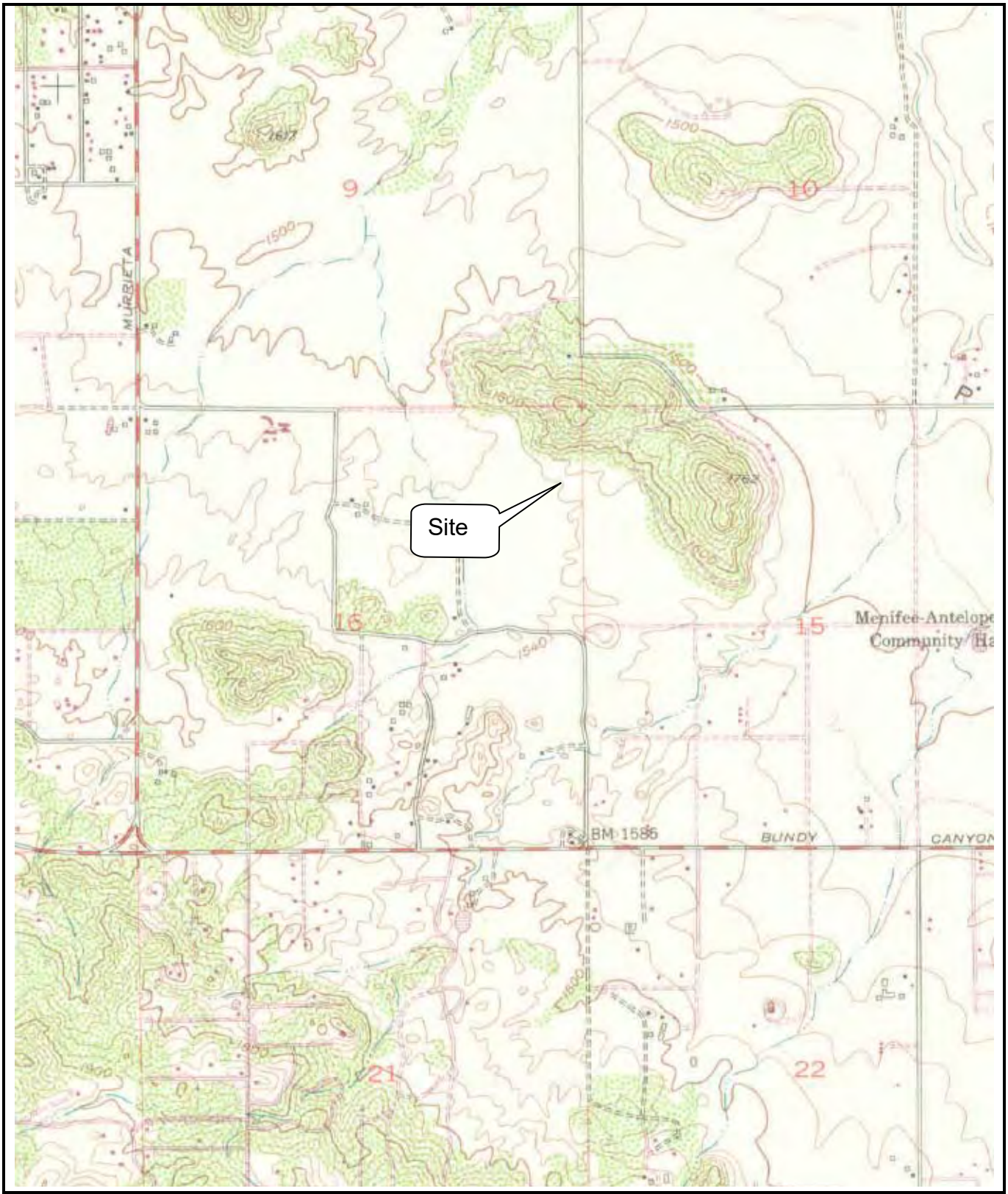


Figure 1: SITE VICINITY MAP	SCALE: (Not to Scale)	N ↑

HILLMANN CONSULTING

Project Location:	Golden Meadows Menifee, CA
Project No.:	C3-5484

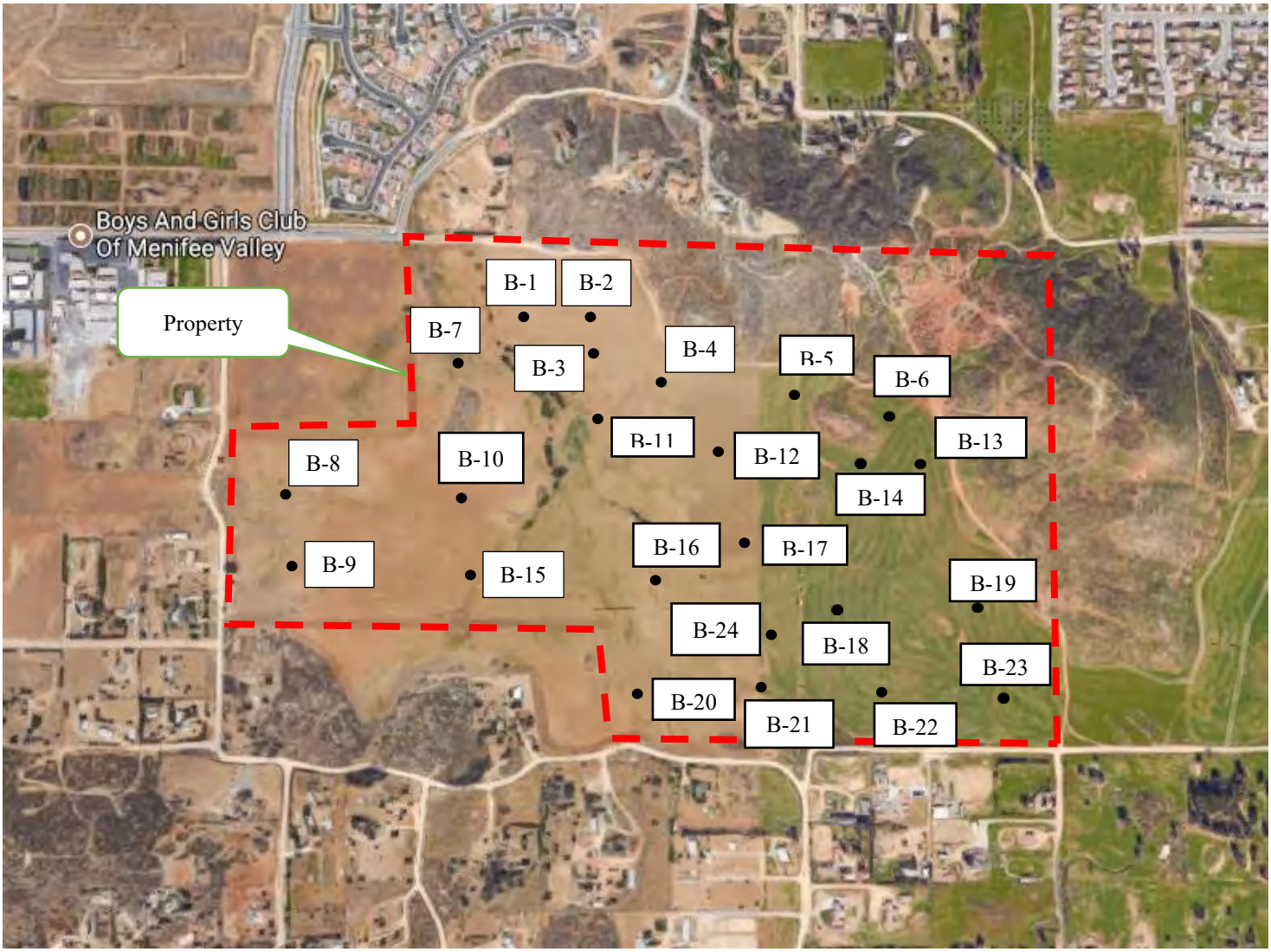
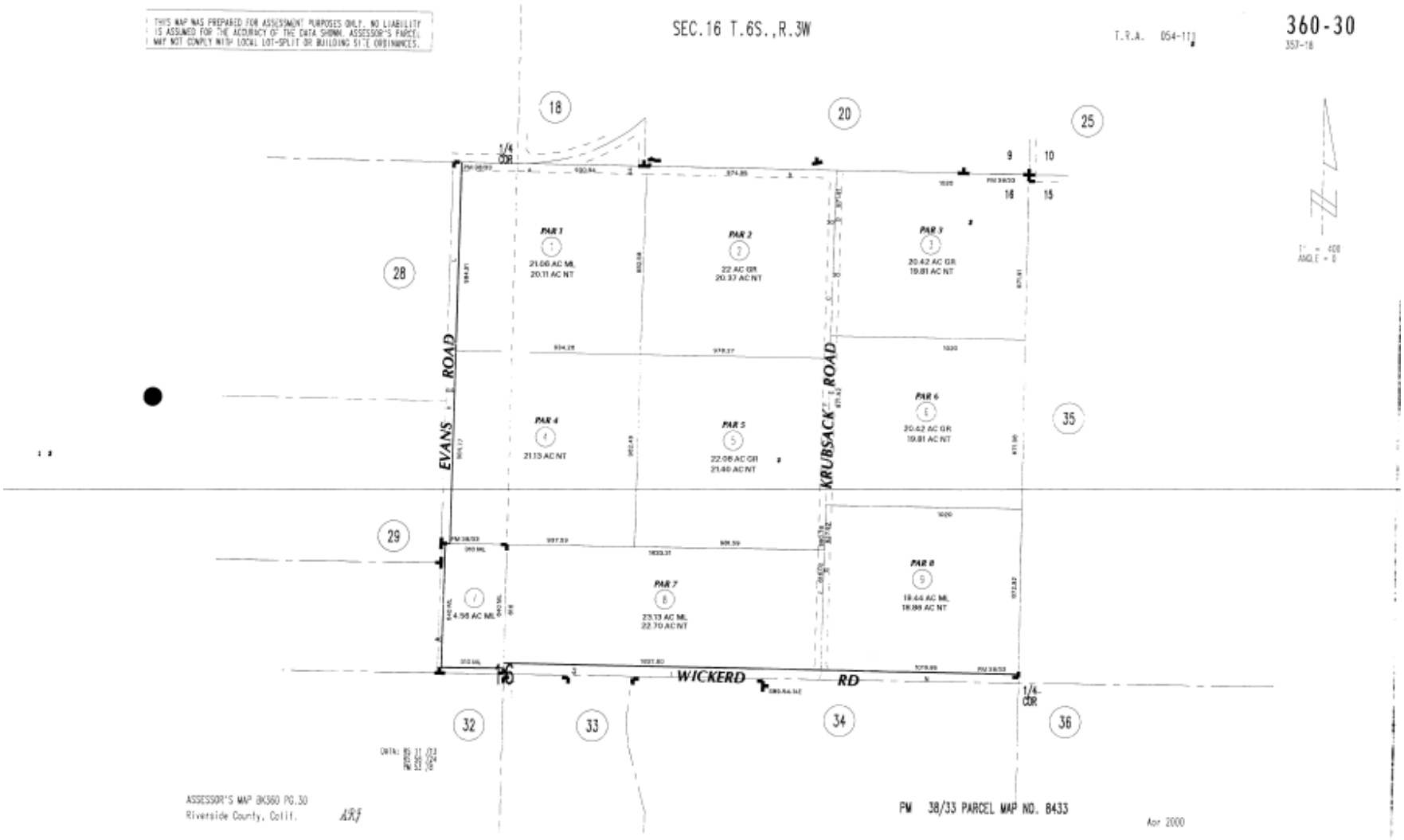


Figure 2: SITE DIAGRAM	SCALE: (Not to Scale)	N

HILLMANN CONSULTING

Project Location:	Golden Meadows Menifee, CA 92584
Project No.:	C3-6927


THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSES ONLY. NO LIABILITY IS ASSUMED FOR THE ACCURACY OF THE DATA SHOWN. ASSESSOR'S PARCEL MAY NOT COMPLY WITH LOCAL LOT-SPLIT OR BUILDING SITE ORDINANCES.
SEC.16 T.6S.,R.3W
T.R.A. 054-117
360-30
357-18
18
20
25
28
29
32
33
34
35
36
9
10
16
15
1/4 COR
PAR 1
21.06 AC ML
20.11 AC NT
PAR 2
22 AC GR
20.37 AC NT
PAR 3
20.42 AC GR
19.81 AC NT
PAR 4
21.13 AC NT
PAR 5
22.06 AC GR
21.40 AC NT
PAR 6
20.42 AC GR
19.81 AC NT
PAR 7
23.13 AC ML
22.70 AC NT
PAR 8
19.44 AC ML
18.88 AC NT
EVANS ROAD
KRUBSACK ROAD
WICKERD RD
ASSESSOR'S MAP BK360 PG.30
Riverside County, Calif.
PM 38/33 PARCEL MAP NO. 8433
Apr 2000

APPENDIX C

HISTORICAL LAND USE DOCUMENTATION/MAPS

Golden Meadows
Golden Meadows
Menifee, CA 92584

Inquiry Number: 3494433.5
January 18, 2013

The EDR Aerial Photo Decade Package

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

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Date EDR Searched Historical Sources:

Aerial Photography January 18, 2013

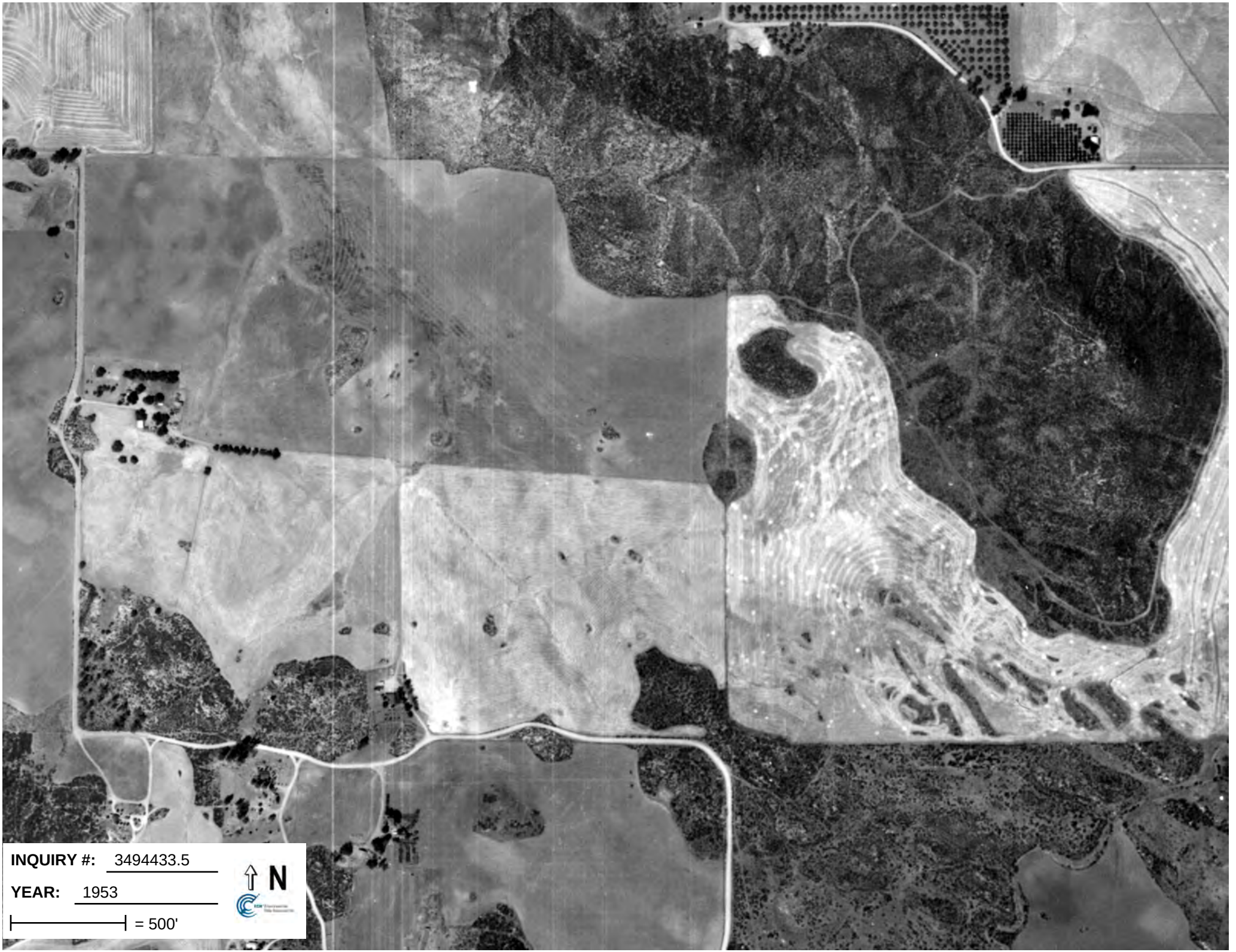
Target Property:

Golden Meadows

Menifee, CA 92584

Year	***Scale***	***Details***	***Source***
1938	Aerial Photograph. Scale: 1"=500'	Flight Year: 1938	Laval
1953	Aerial Photograph. Scale: 1"=500'	Flight Year: 1953	Pacific Air
1967	Aerial Photograph. Scale: 1"=500'	Flight Year: 1967	Western
1976	Aerial Photograph. Scale: 1"=500'	Flight Year: 1976	AMI
1990	Aerial Photograph. Scale: 1"=500'	Flight Year: 1990	USGS
2002	Aerial Photograph. Scale: 1"=500'	/Composite DOQQ - acquisition dates: 2002	EDR
2002	Aerial Photograph. Scale: 1"=500'	/Composite DOQQ - acquisition dates: 2002	EDR
2002	Aerial Photograph. Scale: 1"=500'	/Composite DOQQ - acquisition dates: 2002	EDR
2002	Aerial Photograph. Scale: 1"=500'	/Composite DOQQ - acquisition dates: 2002	EDR
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	EDR
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	EDR
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	EDR
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	EDR

INQUIRY #: 3494433.5
YEAR: 1938
= 500'
N


INQUIRY #: 3494433.5
YEAR: 1953
= 500'
N

INQUIRY #: 3494433.5
YEAR: 1967
= 500'
N

INQUIRY #: 3494433.5
YEAR: 1976
= 500'
N

INQUIRY #: 3494433.5
YEAR: 1990
= 500'
N

INQUIRY #: 3494433.5
YEAR: 2002
= 500'
N

INQUIRY #: 3494433.5
YEAR: 2002
= 500'
N

INQUIRY #: 3494433.5
YEAR: 2002
= 500'
N

INQUIRY #: 3494433.5
YEAR: 2002
= 500'
N

INQUIRY #: 3494433.5
YEAR: 2005
= 500'
N

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YEAR: 2005
= 500'
N

INQUIRY #: 3494433.5
YEAR: 2005
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INQUIRY #: 3494433.5
YEAR: 2005
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INQUIRY #: 3494433.5
YEAR: 2006
= 500'
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INQUIRY #: 3494433.5
YEAR: 2006
= 500'
N

INQUIRY #: 3494433.5
YEAR: 2006
= 500'
N

INQUIRY #: 3494433.5
YEAR: 2006
= 500'
N

Golden Meadows
Golden Meadows
Menifee, CA 92584

Inquiry Number: 3494433.4
January 14, 2013

EDR Historical Topographic Map Report

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800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

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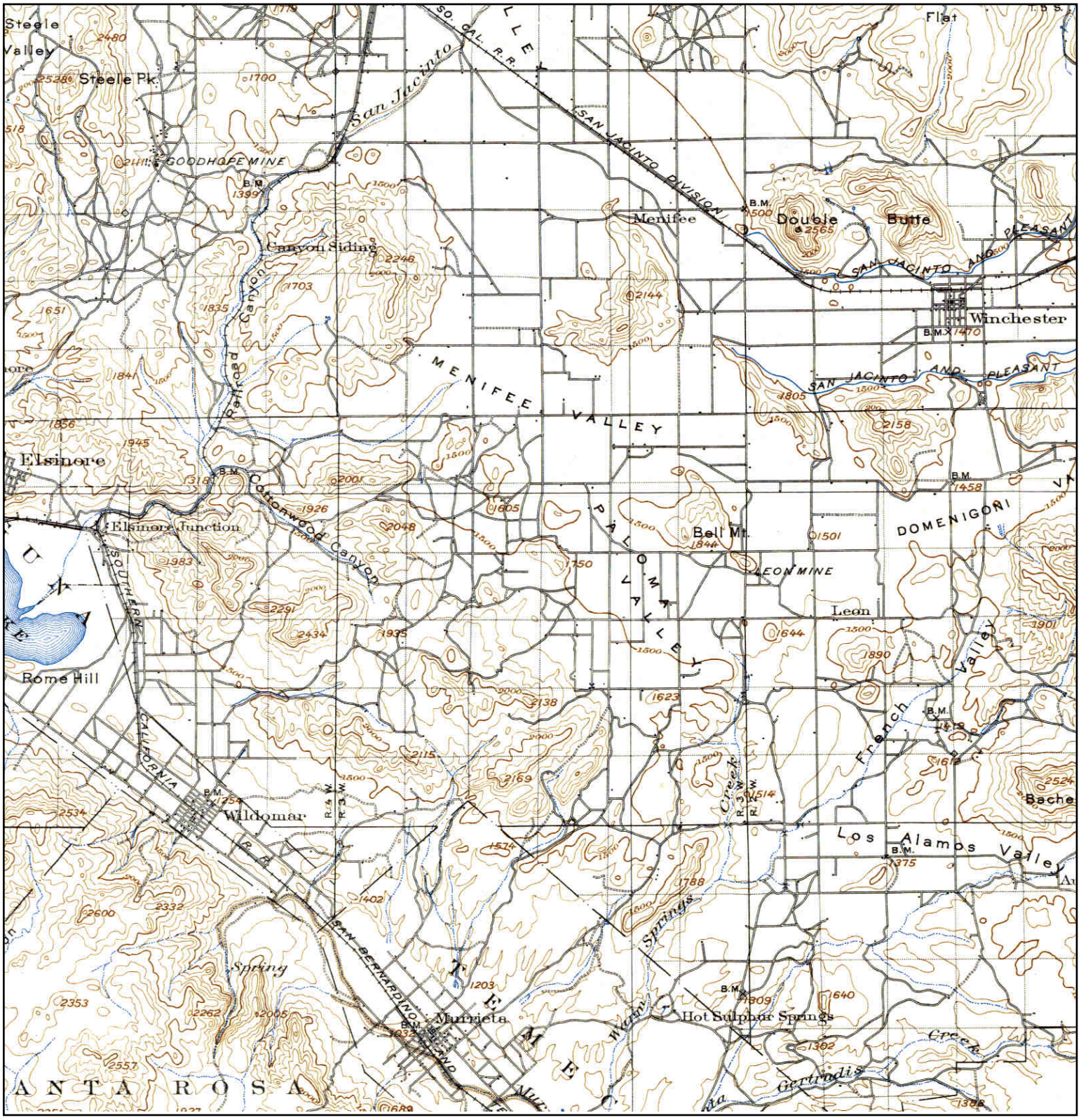
Historical Topographic Map



N	TARGET QUAD NAME: ELSINORE MAP YEAR: 1901 SERIES: 30 SCALE: 1:125000	SITE NAME: Golden Meadows ADDRESS: Golden Meadows Menifee, CA 92584 LAT/LONG: 33.6526 / -117.19	CLIENT: Hillmann Environmental Co. CONTACT: Kristi Hill INQUIRY#: 3494433.4 RESEARCH DATE: 01/14/2013

Historical Topographic Map

N	TARGET QUAD NAME: SOUTHERN CA SHEET 1 MAP YEAR: 1901 SERIES: 60 SCALE: 1:250000	SITE NAME: Golden Meadows ADDRESS: Golden Meadows Menifee, CA 92584 LAT/LONG: 33.6526 / -117.19	CLIENT: Hillmann Environmental Co. CONTACT: Kristi Hill INQUIRY#: 3494433.4 RESEARCH DATE: 01/14/2013

Historical Topographic Map

N	TARGET QUAD NAME: MURRIETA MAP YEAR: 1947 SERIES: 15 SCALE: 1:50000	SITE NAME: Golden Meadows ADDRESS: Golden Meadows Menifee, CA 92584 LAT/LONG: 33.6526 / -117.19	CLIENT: Hillmann Environmental Co. CONTACT: Kristi Hill INQUIRY#: 3494433.4 RESEARCH DATE: 01/14/2013

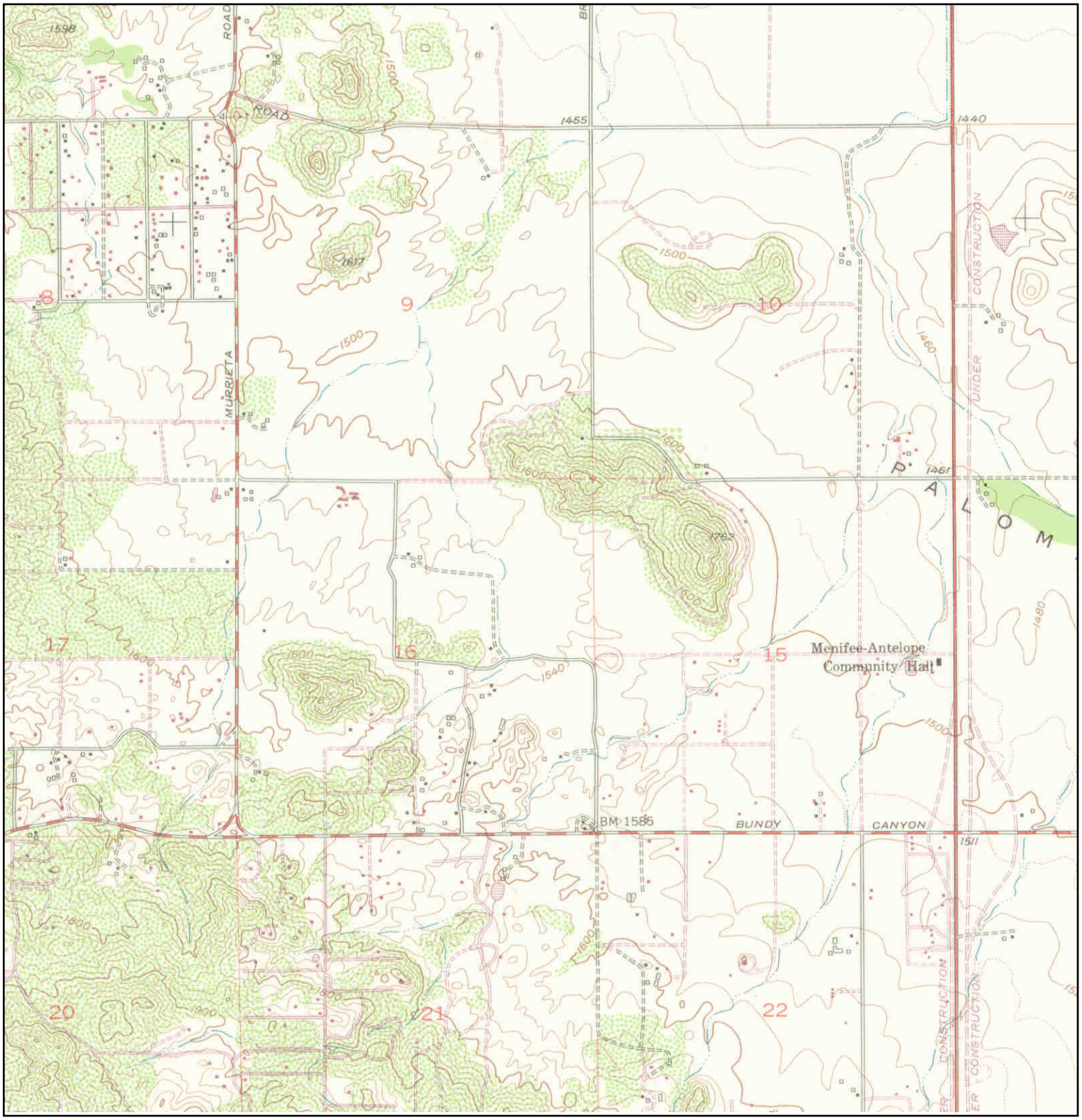
Historical Topographic Map

N	TARGET QUAD NAME: ROMOLAND MAP YEAR: 1953 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Golden Meadows ADDRESS: Golden Meadows Menifee, CA 92584 LAT/LONG: 33.6526 / -117.19	CLIENT: Hillmann Environmental Co. CONTACT: Kristi Hill INQUIRY#: 3494433.4 RESEARCH DATE: 01/14/2013

Historical Topographic Map

N	TARGET QUAD NAME: ROMOLAND MAP YEAR: 1973 PHOTOREVISED FROM :1953 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Golden Meadows ADDRESS: Golden Meadows Menifee, CA 92584 LAT/LONG: 33.6526 / -117.19	CLIENT: Hillmann Environmental Co. CONTACT: Kristi Hill INQUIRY#: 3494433.4 RESEARCH DATE: 01/14/2013

Historical Topographic Map



N	TARGET QUAD NAME: ROMOLAND MAP YEAR: 1979 PHOTOREVISED FROM :1953 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Golden Meadows ADDRESS: Golden Meadows Menifee, CA 92584 LAT/LONG: 33.6526 / -117.19	CLIENT: Hillmann Environmental Co. CONTACT: Kristi Hill INQUIRY#: 3494433.4 RESEARCH DATE: 01/14/2013

Golden Meadows
Golden Meadows
Menifee, CA 92584

Inquiry Number: 3494433.3
January 14, 2013

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

1/14/13

Site Name:
Golden Meadows
Golden Meadows
Menifee, CA 92584

Client Name:
Hillmann Environmental Co.
4510 E. Pacific Coast Hwy
Long Beach, CA 90804

EDR Inquiry # 3494433.3

Contact: Kristi Hill

EDR® Environmental Data Resources Inc

The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by Hillmann Environmental Co. were identified for the years listed below. The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by Sanborn Library LLC, the copyright holder for the collection.

Certified Sanborn Results:

Site Name: Golden Meadows
Address: Golden Meadows
City, State, Zip: Menifee, CA 92584
Cross Street:
P.O. # NA
Project: NA
Certification # F47C-476D-B07B

Sanborn® Library search results
Certification # F47C-476D-B07B

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✓ Library of Congress
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- ✓ EDR Private Collection

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Golden Meadows
Golden Meadows
Menifee, CA 92584

Inquiry Number: 3494433.6
January 17, 2013

The EDR-City Directory Abstract

Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

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City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at five year intervals.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

Year	Source	TP	Adjoining	Text Abstract	Source Image
2011	Haines Criss-Cross Directory	X	X	X	-
2005	Haines Criss-Cross Directory	X	X	X	-
2000	Haines Criss-Cross Directory	X	X	X	-
1995	Haines Criss-Cross Directory	X	X	X	-
1990	Haines Criss-Cross Directory	-	X	X	-
1985	Haines Criss-Cross Directory	-	X	X	-
1980	Haines Criss-Cross Directory	-	X	X	-
1975	Haines Criss-Cross Directory	-	X	X	-

FINDINGS

TARGET PROPERTY INFORMATION

ADDRESS

Golden Meadows
Menifee, CA 92584

FINDINGS DETAIL

Target Property research detail.

Garbani Rd

26255 Garbani Rd

Year	*Uses*	*Source*
2011	Menifee Un School District Food Service	Haines Criss-Cross Directory
	Menifee Un School District Menifee Valley	Haines Criss-Cross Directory
2005	Menifee Middle School	Haines Criss-Cross Directory
	Menifee Union School District	Haines Criss-Cross Directory
2000	Menifee Middle School	Haines Criss-Cross Directory
	Menifee Union School Food Service	Haines Criss-Cross Directory
	Menifee Union School Menifee Valley Middle	Haines Criss-Cross Directory
1995	Menifee Middle School	Haines Criss-Cross Directory
	Menifee School Middle	Haines Criss-Cross Directory

FINDINGS

ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

Garbani Rd

25860 Garbani Rd

Year	Uses	Source
2011	Residential	Haines Criss-Cross Directory
2005	Residential	Haines Criss-Cross Directory
2000	Residential	Haines Criss-Cross Directory

25870 Garbani Rd

Year	Uses	Source
2011	No Return	Haines Criss-Cross Directory
2005	No Return	Haines Criss-Cross Directory
2000	Residential	Haines Criss-Cross Directory
1995	No Return	Haines Criss-Cross Directory
1990	Residential	Haines Criss-Cross Directory
1985	Residential	Haines Criss-Cross Directory
1980	Residential	Haines Criss-Cross Directory

25906 Garbani Rd

Year	Uses	Source
2011	No Return	Haines Criss-Cross Directory
2005	No Return	Haines Criss-Cross Directory
2000	Residential	Haines Criss-Cross Directory
1995	No Return	Haines Criss-Cross Directory
1990	Residential	Haines Criss-Cross Directory
1985	Residential	Haines Criss-Cross Directory

26301 Garbani Rd

Year	Uses	Source
2011	Menifee Un Elem School District	Haines Criss-Cross Directory
	Menifee Un Elem School District Warehouse	Haines Criss-Cross Directory
	Menifee Un School District Menifee Elem	Haines Criss-Cross Directory
2005	Menifee Elem School	Haines Criss-Cross Directory
	Menifee Union School District	Haines Criss-Cross Directory
2000	Menifee Elem School	Haines Criss-Cross Directory

FINDINGS

Year	Uses	Source
2000	Menifee Union School Menifee Elem	Haines Criss-Cross Directory
	Menifee Union School Transportation	Haines Criss-Cross Directory
	Menifee Union School Warehouse	Haines Criss-Cross Directory
1995	Menifee Elem School	Haines Criss-Cross Directory
	Menifee School Elem	Haines Criss-Cross Directory
	Menifee Union School Food Service	Haines Criss-Cross Directory
	Menifee Union School Transportation	Haines Criss-Cross Directory
	Menifee Union School Warehouse	Haines Criss-Cross Directory
1990	Menifee Elem School	Haines Criss-Cross Directory
	Menifee Union School Transportation	Haines Criss-Cross Directory
1985	Menifee Elem School	Haines Criss-Cross Directory
	Menifee Union School District	Haines Criss-Cross Directory
1980	Menifee Union School	Haines Criss-Cross Directory
1975	Menifee Union School	Haines Criss-Cross Directory

26665 Garbani Rd

Year	Uses	Source
2011	Residential	Haines Criss-Cross Directory
2005	Residential	Haines Criss-Cross Directory
2000	Residential	Haines Criss-Cross Directory

26675 Garbani Rd

Year	Uses	Source
2011	No Return	Haines Criss-Cross Directory
2005	No Return	Haines Criss-Cross Directory
1990	No Return	Haines Criss-Cross Directory
1985	Residential	Haines Criss-Cross Directory

FINDINGS

TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

Address Researched	Address Not Identified in Research Source
Golden Meadows	1990, 1985, 1980, 1975

ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

Address Researched	Address Not Identified in Research Source
25860 Garbani Rd	1995, 1990, 1985, 1980, 1975
25870 Garbani Rd	1975
25906 Garbani Rd	1980, 1975
26301 Garbani Rd	No Years Found
26665 Garbani Rd	1995, 1990, 1985, 1980, 1975
26675 Garbani Rd	2000, 1995, 1980, 1975

APPENDIX D

REFERENCE DOCUMENTATION / LABORATORY RESULTS (if applicable)

HILLMANN
CONSULTING

January 15, 2013

Attn: File Review Request
State of California
Regional Water Quality Control Board – Santa Ana Region (8)
Underground Storage Tank (UST) File Review Division
3737 Main Street, Suite #500
Riverside, CA 92501-3339
Phone (951) 782-4130
Fax (951) 781-6288

RE: Environmental Files:

West of Interstate 215, South of Garbani Road, North of Wickerd Road and East of Evans Road
Menifee, CA

Dear Sir/Madam:

I would like to know if you have any environmental files (UST, groundwater, wells, etc.) for the above referenced property. Please call me and let me know whether or not you locate any records. If you locate any records for the property, I would like to either obtain copies or schedule a file review. My office number is (714) 634-9500.

Sincerely,

Kristi Hill
Administrative Assistant
Hillmann Consulting, LLC

HILLMANN
CONSULTING

January 15, 2013

State of California
Regional Water Quality Control Board – San Diego Region (9)
Underground Storage Tank (UST) File Review Division
9771 Clairemont Mesa Boulevard, Suite A
San Diego, CA 92124
Phone (858) 467-2952
Fax (858) 571-6972

RE: Environmental Files:

West of Interstate 215, South of Garbani Road, North of Wickerd Road and East of Evans Road
Menifee, CA

Dear Sir/Madam:

I would like to know if you have any environmental files (UST, groundwater, wells, etc.) for the above referenced property. Please call me and let me know whether or not you locate any records. If you locate any records for the property, I would like to either obtain copies or schedule a file review. My office number is (714) 634-9500.

Sincerely,

Kristi Hill
Administrative Assistant
Hillmann Consulting, LLC

HILLMANN
CONSULTING

January 15, 2013

South Coast Air Quality Management District
Attn: Public Records
21865 East Copley Drive
Diamond Bar, CA 91765
Phone (909) 396-3700
Fax (909) 396-2961

RE: Environmental Information/Files:

West of Interstate 215, South of Garbani Road, North of Wickerd Road and East of Evans Road
Menifee, CA

Dear Sir/Madam:

Hillmann Environmental Group, LLC is conducting an environmental investigation of the property located at the above referenced address. Under the Freedom of Information Act, we are requesting any information your office has regarding the above referenced property. Please contact me and let me know whether or not you locate any records. If you locate any records, I would like to either obtain copies or schedule a file review. My office number is (714) 634-9500.

Sincerely,

Kristi Hill
Administrative Assistant
Hillmann Consulting, LLC

HILLMANN
CONSULTING

January 15, 2013

Attn: File Review
Riverside County Department of Environmental Health
4065 County Circle Drive
P. O. Box 7600
Riverside, CA 92513-7600
Phone (951) 358-5055
Fax (951) 358-5017

RE: Underground Storage Tank/Hazardous Materials Files:

West of Interstate 215, South of Garbani Road, North of Wickerd Road and East of Evans Road
Menifee, CA

Dear Sir/Madam:

I am currently conducting a Phase I Environmental Site Assessment (ESA) at the above referenced property and would like to know if you have any records of underground storage tanks (USTs) or hazardous materials on file for the above referenced property. If you locate any records for the property, I would like to either obtain copies or schedule a file review. My office number is (714) 634-9500.

Sincerely,

Kristi Hill
Administrative Assistant
Hillmann Consulting, LLC

HILLMANN
CONSULTING

January 15, 2013

Riverside County Fire Department
210 West San Jacinto Avenue
Perris, CA 92570
Phone (951) 940-6900
Fax (951) 940-6910

RE: Underground Storage Tank/Hazardous Materials Files:

West of Interstate 215, South of Garbani Road, North of Wickerd Road and East of Evans Road
Menifee, CA

Dear Sir/Madam:

I am currently conducting a Phase 1 Environmental Site Assessment (ESA) at the above referenced property and would like to know if you have any records of underground storage tanks (USTs) or hazardous materials on file for the above referenced property. If you locate any records for the property, I would like to either obtain copies or schedule a file review. My office number is (714) 634-9500.

Sincerely,

Kristi Hill
Administrative Assistant
Hillmann Consulting, LLC

HILLMANN
CONSULTING

January 15, 2012

Attn: File Review
State of California
Department of Toxic Substances Control
Region 4 – Cypress Regional Office
5796 Corporate Avenue
Cypress, CA 90630-4732
Phone (714) 484-5337
Fax (714) 484-5318

RE: DTSC Files:

West of Interstate 215, South of Garbani Road, North of Wickerd Road and East of Evans Road
Menifee, CA

Dear Sir/Madam:

I would like to know if you have any records of violations or environmental concerns on file for the above referenced property. Please call me and let me know whether or not you locate any records. If you locate any records for the property, I would like to either obtain copies or schedule a file review. My office number is (714) 634-9500.

Sincerely,

Kristi Hill
Administrative Assistant
Hillmann Consulting, LLC

PROPERTY OVERVIEW

OPPORTUNITY OVERVIEW

Golden Meadows was originally owned and entitled by Woodside Homes. The project consists of approximately 206.8 acres and has been approved for 472 single family detached lots with a minimum size of 6,000 square feet.

Ideally located between the Newport Road and Scott Road exits along the west side of CA Interstate 215, this project is in very close proximity to the recently completed Countryside Marketplace, which includes a variety of dining, shopping and service alternatives. Retailers include Lowes, Super Target, Old Navy, Best Buy and Kohls. In addition, Golden Meadows is less than a half mile from Menifee Valley Middle School and Paloma Valley High School; and a few miles from the partially constructed Loma Linda University Medical Center | Murrieta, located to the south in the City of Murrieta.

The subject property represents one of the last entitled, non-builder controlled acquisition opportunities between Garbani Road in southern Menifee to the San Diego County border.

MARKET

City of Menifee, California

PROPERTY LOCATION

The subject property is located less than one mile west of CA Interstate 215, south of Garbani Road, north of Wickerd Road, and east of Evans Road within the newly incorporated City of Menifee, Riverside County, CA.

ENTITLEMENTS

Tract No. 31194 was approved in April 2007 by the County of Riverside. The entitlement is valid through April 2013. According to an appraisal completed in 2009, improvement plans were ready for 1st Plan Check.

LOT COUNT

The subject consists of 472 single family lots with a minimum size of 6,000 square feet.

SITE CONDITION

Unimproved

COMMUNITY FACILITIES DISTRICT

The subject property is currently located within the policy area for the Scott Road CFD. No other CFDs have been funded on this project. The 2009 / 2010 tax information is summarized as follows:

Tax Rate Area:	026-093
2009-2010 Tax Rate (per $100 of Assessed Value):	1.00827%
Effective Tax Rate (including special assessments):	1.1109%

IMPROVEMENT COSTS

According to the December 2009 appraisal, Woodside Homes had provided a preliminary estimate of development costs for this project. The total estimated gross cost to complete for this project was approximately $92,844 per lot (including fees, but not including any future CFD assumptions).

Fees | $35,310 per lot

On-site Costs | $22,746 per lot

Off-site Costs | $34,787 per lot

SCHOOL DISTRICT

Menifee Union School District & Perris Union High School District

HOA

A HOA shall be required for the maintenance of common areas. Formation of any future HOA would be the responsibility of the buyer.

BONDING REQUIREMENTS

There is no requirement to replace existing improvement bonds. Bonding upon recordation of the Final Map shall be the responsibility of the buyer.

Paloma Valley
High School
Craig Avenue
KB
HOME
RSI
RICHMOND
AMERICAN HOMES
INTERSTATE
215
Garbani Road
Men Valley
Mid School
GOLDEN MEADOWS
Evans Road
entative Tract Map No. 31194
evised Illustrated Tentative Map

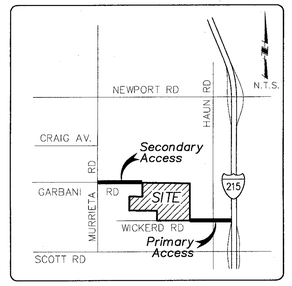
LOT SUMMARY TABLE

LOT NO.	GROSS SQ.FT.	NET SQ.FT.	LOT NO.	GROSS SQ.FT.	NET SQ.FT.	LOT NO.	GROSS SQ.FT.	NET SQ.FT.	LOT NO.	GROSS SQ.FT.	NET SQ.FT.	LOT NO.	GROSS SQ.FT.	NET SQ.FT.
1	8,977	8,386	82	7,668	7,668	163	10,224	9,801	244	8,353	7,434	325	11,146	10,585
2	7,594	7,594	83	7,684	7,684	164	12,117	11,506	245	7,993	7,642	326	13,590	12,477
3	7,586	7,586	84	9,758	9,758	165	10,200	9,652	246	8,037	7,896	327	6,120	6,120
4	7,298	7,298	85	9,716	9,716	166	9,988	9,310	247	8,606	8,606	328	6,000	6,000
5	7,253	7,253	86	8,643	8,643	167	16,658	14,364	248	8,921	8,923	329	6,000	6,000
6	10,130	9,077	87	8,292	9,292	168	34,683	26,742	249	9,053	9,057	330	6,324	6,324
7	10,914	9,567	88	8,618	8,618	169	21,850	10,421	250	8,586	8,586	331	6,261	6,261
8	8,583	6,818	89	9,302	8,402	170	14,874	10,083	251	9,089	9,089	332	6,381	6,381
9	10,021	8,575	90	11,630	9,216	171	15,268	11,433	252	11,979	10,698	333	6,408	6,408
10	10,855	8,117	91	10,170	8,545	172	15,596	11,967	253	11,055	10,242	334	6,381	6,381
11	9,724	8,154	92	10,159	8,381	173	15,512	12,254	254	8,533	8,203	335	6,488	6,488
12	7,506	7,323	93	11,367	8,946	174	14,059	12,003	255	10,386	9,683	336	6,488	6,488
13	8,162	7,771	94	11,821	9,119	175	13,200	11,702	256	12,400	9,870	337	6,488	6,488
14	8,758	8,132	95	11,645	8,995	176	12,976	11,371	257	9,014	8,914	338	6,488	6,488
15	8,356	8,356	96	10,933	8,533	177	12,364	11,717	258	10,149	9,498	339	6,218	6,218
16	7,314	7,314	97	11,864	9,586	178	12,987	12,485	259	8,180	7,332	340	6,010	6,010
17	9,002	9,002	98	13,663	9,657	179	12,704	12,441	260	7,210	7,210	341	6,413	6,413
18	13,856	9,910	99	12,648	8,794	180	14,117	13,938	261	8,964	8,964	342	8,612	6,931
19	11,252	9,861	100	11,602	8,305	181	6,623	6,058	262	10,887	8,878	343	7,043	7,043
20	15,416	11,502	101	11,295	7,748	182	13,442	13,442	263	8,945	8,234	344	8,065	8,065
21	16,683	11,161	102	10,989	7,248	183	17,235	15,583	264	8,511	7,637	345	7,534	7,534
22	16,020	10,449	103	10,716	6,928	184	13,993	13,544	265	8,581	7,615	346	7,591	7,591
23	13,892	9,131	104	10,688	6,946	185	10,222	10,222	266	7,500	7,319	347	8,064	8,064
24	12,782	8,528	105	10,954	7,582	186	8,477	8,121	267	8,380	7,829	348	8,128	8,128
25	12,642	8,614	106	10,464	6,851	187	13,307	12,887	268	11,197	8,900	349	7,242	7,242
26	12,870	9,118	107	10,113	6,581	188	11,470	11,470	269	8,616	7,090	350	7,251	7,251
27	12,921	8,615	108	9,755	6,374	189	9,756	9,756	270	8,515	6,895	351	8,227	8,227
28	10,725	8,301	109	9,587	6,428	190	8,573	8,573	271	9,185	7,414	352	8,340	8,340
29	10,312	8,862	110	13,496	8,453	191	8,700	8,500	272	11,105	10,102	353	8,363	8,363
30	8,619	7,639	111	13,562	8,174	192	9,654	9,306	273	10,321	9,531	354	7,932	7,596
31	7,583	7,092	112	7,226	7,226	193	9,302	9,302	274	9,010	7,186	355	8,003	7,484
32	7,192	7,003	113	7,215	7,215	194	9,134	9,134	275	8,214	6,584	356	7,979	7,979
33	7,197	7,014	114	7,215	7,215	195	8,911	8,911	276	8,830	8,644	357	7,311	7,311
34	7,907	7,885	115	7,215	7,215	196	8,737	8,737	277	11,954	11,564	358	7,247	7,247
35	7,583	7,156	116	7,554	7,554	197	7,416	7,416	278	7,958	7,272	359	7,247	7,247
36	7,454	7,198	117	7,536	7,536	198	7,613	6,985	279	6,839	6,371	360	7,690	7,690
37	7,546	6,991	118	7,863	6,792	199	12,265	11,050	280	11,277	10,955	361	DELETED	DELETED
38	10,218	8,562	119	DELETED	DELETED	200	11,694	11,694	281	8,984	8,984	362	DELETED	DELETED
39	12,448	7,905	120	DELETED	DELETED	201	10,704	10,704	282	12,581	12,581	363	DELETED	DELETED
40	10,858	7,973	121	8,669	8,669	202	9,454	9,454	283	12,553	12,553	364	7,598	7,598
41	12,241	7,878	122	8,324	8,324	203	DELETED	DELETED	284	11,754	11,754	365	8,035	8,035
42	13,649	7,980	123	7,234	7,234	204	DELETED	DELETED	285	8,685	8,685	366	7,207	7,207
43	14,383	7,978	124	8,016	7,411	205	7,692	7,692	286	8,434	8,434	367	8,484	8,484
44	14,026	7,979	125	7,860	7,348	206	7,811	7,811	287	9,141	8,646	368	9,503	9,503
45	13,649	7,978	126	8,080	7,152	207	8,180	8,180	288	8,631	7,757	369	7,214	7,214
46	7,858	7,480	127	9,353	8,207	208	7,209	7,209	289	9,156	8,309	370	8,130	8,130
47	7,645	7,261	128	8,501	7,800	209	7,612	7,296	290	9,856	9,211	371	7,776	7,776
48	7,638	7,266	129	7,772	7,151	210	8,080	7,480	291	9,586	8,992	372	7,820	7,223
49	7,603	7,286	130	DELETED	DELETED	211	8,080	7,405	292	11,363	9,573	373	9,068	8,069
50	8,615	8,301	131	DELETED	DELETED	212	8,473	7,774	293	7,384	6,904	374	6,359	7,854
51	12,890	12,886	132	8,778	8,080	213	7,994	7,453	294	6,400	6,400	375	8,877	8,274
52	8,037	8,037	133	8,418	7,578	214	DELETED	DELETED	295	6,403	6,403	376	8,624	7,830
53	10,196	8,393	134	8,758	7,733	215	DELETED	DELETED	296	6,400	6,400	377	8,308	7,219
54	10,865	9,564	135	9,373	8,126	216	11,586	11,586	297	6,400	6,400	378	10,927	10,358
55	8,348	8,348	136	9,991	8,496	217	9,787	9,787	298	6,970	6,133	379	9,162	8,225
56	8,348	8,348	137	10,525	8,800	218	14,203	14,203	299	7,538	6,795	380	9,055	8,015
57	8,348	8,348	138	9,713	7,800	219	11,945	11,629	300	6,541	5,955	381	11,418	9,801
58	8,348	8,348	139	12,192	8,711	220	14,254	13,110	301	6,541	5,977	382	16,098	15,411
59	7,751	7,751	140	14,871	10,835	221	9,718	8,843	302	6,541	5,975	383	8,827	8,827
60	7,751	7,751	141	8,791	8,791	222	7,785	7,526	303	6,555	5,987	384	7,329	7,219
61	7,751	7,751	142	8,568	8,568	223	8,881	7,801	304	6,930	7,106	385	7,346	7,346
62	7,751	7,751	143	8,193	8,193	224	8,856	8,202	305	8,411	7,877	386	7,670	7,670
63	7,751	7,751	144	7,861	7,861	225	7,752	7,752	306	7,671	7,671	387	7,566	7,566
64	7,751	7,751	145	8,286	8,286	226	7,690	7,690	307	8,025	8,025	388	7,467	7,467
65	7,751	7,751	146	7,337	7,337	227	8,268	8,268	308	6,890	6,895	389	7,696	7,696
66	7,751	7,751	147	7,337	7,337	228	12,478	12,478	309	7,340	6,277	390	7,702	7,702
67	8,044	8,044	148	7,334	7,334	229	15,107	15,107	310	9,560	8,567	391	7,778	7,778
68	8,518	8,518	149	7,337	7,337	230	8,490	8,490	311	9,397	8,819	392	12,547	12,547
69	8,651	7,902	150	7,825	7,825	231	8,066	8,066	312	6,829	6,274	393	10,798	10,444
70	9,693	8,785	151	8,156	8,156	232	7,735	7,735	313	15,095	11,184	394	8,052	7,586
71	9,578	9,578	152	7,403	7,403	233	7,700	7,700	314	8,751	8,550	395	8,681	7,838
72	9,228	9,688	153	7,707	7,707	234	7,700	7,700	315	8,052	8,052	396	8,140	7,717
73	8,309	7,997	154	7,443	7,443	235	7,700	7,700	316	8,429	8,429	397	8,197	7,775
74	8,669	8,538	155	7,229	7,006	236	7,700	7,700	317	8,802	7,348	398	8,255	7,832
75	7,997	7,694	156	7,653	7,410	237	7,700	7,700	318	8,730	8,308	399	8,571	8,135
76	7,378	7,159	157	8,899	8,665	238	8,007	8,007	319	7,470	7,470	400	9,830	9,504
77	7,352	7,278	158	9,178	8,992	239	8,769	8,769	320	8,072	7,274	401	9,233	8,785
78	8,873	8,586	159	8,837	8,595	240	8,540	7,775	321	7,501	6,581	402	9,783	9,231
79	10,198	9,498	160	8,934	8,781	241	8,005	8,005	322	6,233	6,233	403	10,801	10,000
80	8,604	8,604	161	9,225	8,064	242	8,451	8,451	323	6,598	5,867	404	13,399	12,266
81	8,025	8,025	162	15,373	14,170	243	7,850	7,200	324	12,653	10,643	405	9,250	8,291

TOTAL	4,399,677	GROSS SQ.FT
TOTAL	4,076,053	NET SQ.FT
AVERAGE	9,287	GROSS SQ.FT
AVERAGE	8,599	NET SQ.FT

LOT NO.	GROSS SQ.FT.	NET SQ.FT.
406	8,856	7,782
407	8,895	7,524
408	8,037	7,483
409	9,190	7,483
410	9,274	7,438
411	9,243	7,460
412	9,185	7,605
413	8,528	7,859
414	9,071	8,003
415	9,667	8,805
416	2,310	2,310
417	7,780	6,921
418	9,673	7,809
419	8,974	8,075
420	8,974	7,849
421	8,974	7,812
422	8,974	8,015
423	8,972	8,552
424	8,792	8,572
425	8,184	7,537
426	7,670	6,956
427	8,240	7,163
428	10,956	8,590
429	9,142	8,655
430	9,194	8,595
431	9,651	9,544
432	8,828	8,518
433	9,471	8,855
434	9,625	9,036
435	8,610	8,610
436	8,592	8,592
437	10,353	10,001
438	8,764	8,238
439	9,031	9,031
440	7,776	7,776
441	7,928	7,328
442	8,448	8,328
443	DELETED	DELETED
444	8,972	7,981
445	8,598	7,513
446	14,636	8,965
447	16,074	11,697
448	11,356	9,580
449	10,108	8,765
450	9,963	8,050
451	8,450	7,552
452	7,829	7,829
453	7,339	7,339
454	7,428	7,428
455	7,265	7,265
456	7,273	7,273
457	7,375	7,375
458	8,912	7,586
459	8,724	7,879
460	7,513	7,513
461	7,388	7,388
462	7,323	7,323
463	7,308	7,308
464	7,270	7,270
465	7,428	7,428
466	8,375	8,375
467	7,653	6,848
468	7,792	7,792
469	7,524	7,524
470	7,483	7,483
471	9,190	7,483
472	9,274	7,438
473	9,243	7,460
474	9,185	7,605
475	8,528	7,859
476	9,071	8,003
477	9,667	8,805
478	2,310	2,310
479	7,780	6,921
480	9,673	7,809
481	8,974	8,075
482	8,974	7,849
483	8,974	7,812
484	8,974	8,015
485	8,972	8,552
486	8,792	8,572

VICINITY MAP



NOTES

1. EXISTING LAND USE: VACANT
2. PROPOSED LAND USE: RESIDENTIAL, SINGLE FAMILY & ASSOCIATED PARK & OPEN SPACE
3. EXISTING ZONING: A-1-10
4. PROPOSED ZONING & GENERAL PLAN: R1, R4, AND R5
5. SITE IS NOT SUBJECT TO OVERFLOW, INUNDATION, FLOOD HAZARDS.
6. THOMAS GUIDE: PAGE 868 7C & D RIVERSIDE COUNTY (2003 ED.)
7. THE TENTATIVE TRACT MAP CONTAINS THE ENTIRE CONTIGUOUS OWNERSHIP OF THE LAND DIVIDER.
8. COMMUNITY PLAN SUN CITY MENIFEE VALLEY (1 AC. MIN.)
9. COMMUNITY SERVICE AREA 152
10. NO KNOWN EXISTING WELLS ARE ON THE PROPERTY, OR WITHIN 200 FEET OF THE PROPERTY BOUNDARY.
11. NO SEPTIC SEWAGE IS INTENDED FOR THIS SITE.
12. THE LAND IS NOT SUBJECT TO LIQUEFACTION OR OTHER GEOLOGIC HAZARDS, AND IS NOT LOCATED WITHIN A SPECIAL STUDIES ZONE.
13. FEMA FLOOD ZONE C, 060245-2095A
14. NO "CONSTRAINED AREAS" ARE KNOWN TO EXIST ON THIS SITE. SHOULD ANY CONSTRAINED AREAS BE DISCOVERED, THESE WILL BE ADDRESSED ON FUTURE LAND DIVISIONS.
15. PROPOSED IMPROVEMENT SCHEDULE: "A"
16. DEVELOPMENT IMPACT FEE: SUN CITY / MENIFEE
17. SCHOOL DISTRICT: MENIFEE UNION / PERRIS UNION HIGH
18. THIS PROPERTY IS WITHIN SAN JACINTO VALLEY WATERSHED
19. THIS AREA IS NOT WITHIN FIRE AREA
20. THIS APPLICATION IS FOR A DEVELOPMENT PERMIT.
21. FINAL PROJECT GRADING SHALL COMPLY WITH NPDES SUPPLEMENT A.
22. PRIMARY ACCESS IS ALONG WICKERD ROAD EASTERLY TO HAUN ROAD.
23. SECONDARY ACCESS TO GARBANI ROAD TO THE NORTHWEST TO THE EXISTING PAVED ROAD.

LOT SUMMARY TABLE

Lot No.	Land Use	Acreage
1–118, 121–129, 132–202*, 205–213, 216–360, 364–442,* 444–488*	RESIDENTIAL LOTS	103.2
487 – 489	PARK	7.3
490, 491, 493 – 496*	OPEN SPACE / DRAINAGE EASEMENT	0.5
497 – 499	WATER QUALITY BASIN	2.7
500 – 529	OPEN SPACE / LANDSCAPE	49.5
ROADS		43.6
TOTAL		206.8

*LOTS 361, 362, 363 & 492 HAVE BEEN DELETED.
LOTS 119, 120, 130, 131, 203, 204, 214, 215 & 443 HAVE BEEN DELETED TO INCREASE THE PARK AREA.

LEGAL DESCRIPTION

IN UNINCORPORATED TERRITORY OF THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, BEING A PORTION OF THE WEST HALF OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 6 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, ALONG WITH PARCELS 2 THROUGH 6, INCLUSIVE, PARCEL 8, PARCELS B THROUGH H, INCLUSIVE, AND PARCEL K, ALL OF PARCEL MAP NO. 8433, SECTION 16, TOWNSHIP 6S, RANGE 3W AND SECTION 15, TOWNSHIP 6S, RANGE 3W PER MAP FILED IN BOOK 38, PAGE 33 OF PARCEL MAPS IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

A.P. NO.
360–300–002, 360–300–003, 360–300–004, 360–300–005, 360–300–006, 360–300–009 AND 360–350–001

UTILITIES

ELECTRIC — SOUTHERN CALIFORNIA EDISON, 401 FOURTH ST., PERRIS, CA, (909) 657–2427

TELEPHONE — VERIZON, 29310 BRADLEY DR., SUNCITY, CA. 92586, (800) 483–3000

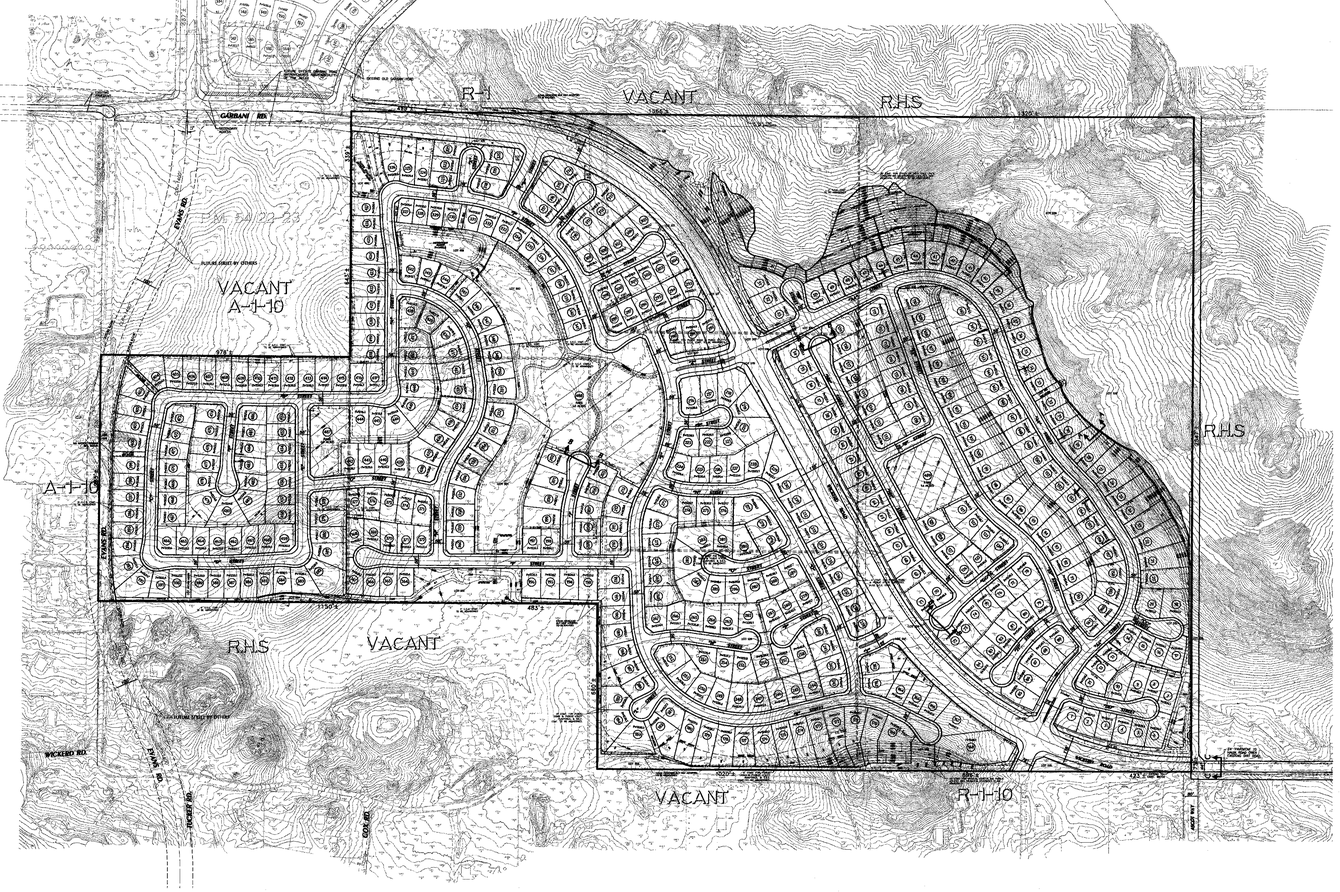
GAS — SOUTHERN CALIFORNIA GAS COMPANY, 3700 CENTRAL AVE., RIVERSIDE, CA, (909) 781–6051

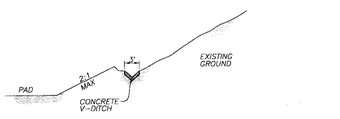
WATER — EASTERN MUNICIPAL WATER DISTRICT, 2270 TRUMBLE ROAD, PERRIS, CA 92572, (909) 928–3777

SEWER — EASTERN MUNICIPAL WATER DISTRICT, 2270 TRUMBLE ROAD, SUN CITY, CA. 92586, (909) 928–3777

CABLE T.V. — MEDIA COM, 27192 SUN CITY BLVD. STE. A, SUN CITY CA. 92586, (909) 679–2327

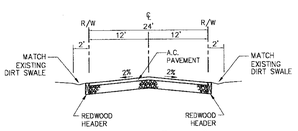
SCHOOL DISTRICT — MENIFEE UNION SCHOOL DISTRICT, 30205 MENIFEE ROAD, MENIFEE, CA, (909) 672–1851; PERRIS UNION HIGH SCHOOL DISTRICT, 155 EAST FOURTH STREET, PERRIS, CA, (909) 946–6369



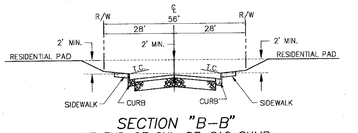


SECTION "A–A"
NOT TO SCALE

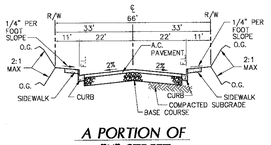
NOTE: DRAINAGE TO COMPLY WITH NPDES SUPPLEMENT "A".



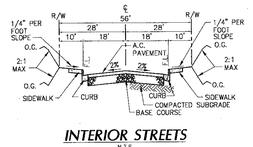
SECTION "C–C"
PAVEMENT FROM EASTERLY PROJECT BOUNDARY TO HAUN ROAD



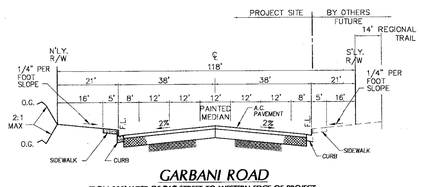
SECTION "B–B"
AT END OF CUL–DE–SAC SUMP



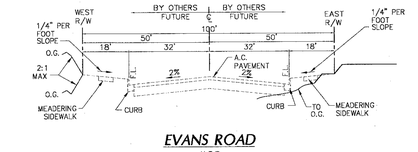
A PORTION OF "K" STREET
N.T.S.



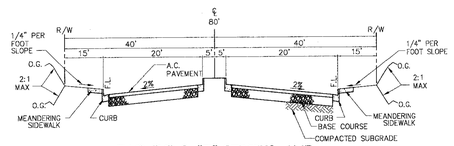
INTERIOR STREETS
N.T.S.



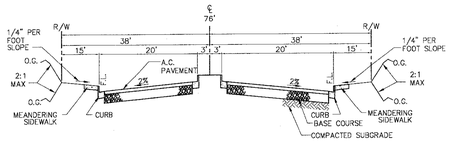
GARBANI ROAD
FROM 300' WEST OF "W" STREET TO WESTERN EDGE OF PROJECT
N.T.S.



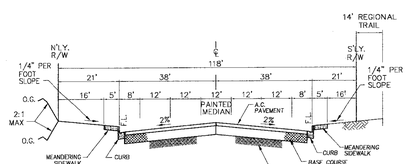
EVANS ROAD
N.T.S.



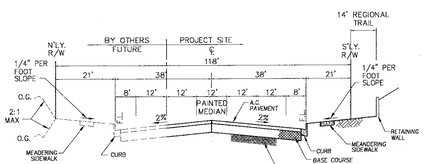
"W", "Y" & "Z" STREETS, AND PORTION OF "AA" STREET
N.T.S.



A PORTION OF "AA" STREET
N.T.S.



WICKERD ROAD
FROM 300' WEST OF "W" STREET TO 200' EAST OF THE SOUTHERLY INTERSECTION OF "AA" STREET
N.T.S.



WICKERD ROAD
FROM 200' EAST OF THE SOUTHERLY INTERSECTION TO EASTERLY EDGE OF PROJECT
N.T.S.

DESIGNED BY: J.W.
DRAFTED BY: PW / JAC / MA
PROCESSED BY: D.H.

DATE	REVISION	BY
12/19/6	REVISE PER PLANNING COMM. COMMENTS	JAC
7/28/06	REVISE PER COUNTY COMMENTS	JAC
5/22/06	REVISE PER COUNTY COMMENTS	JAC
12/6/05	REVISE PER COUNTY COMMENTS	JAC
10/5/05	REVISE PER COUNTY COMMENTS	JAC

MAP DATE IDENTIFIER
DAY, OF WEEK, NUMBER, YR., MO., ETC.
01/10/07
BY: JAC
DAY, OF WEEK, NUMBER, YR., MO., ETC.
01/10/07

NORTH

0 100' 200' 400'

EXHIBIT P (Sheets 1–2)
TR31194
Dated: 2/02/07
Planner: L. Ross

STATEMENT OF OWNERSHIP

I HEREBY STATE THAT THIS MAP WAS PREPARED UNDER MY SUPERVISION AND THAT THE OWNER OF RECORD HAS KNOWLEDGE OF AND CONSENTS TO THE FILING OF THIS MAP.

DATE

REGISTERED PROFESSIONAL ENGINEER — Jeffrey A.S. Shroyer — NO. 24068 — Exp. 12/31/05 — STATE OF CALIFORNIA

APPROVED — APR 10 2007 — BOARD OF SUPERVISORS

OWNER:
Pleasant Valley Investments
23121 Antonio Parkway #120
Rancho Santa Margarita, CA 92688
Tel: (949) 858-4984

SCALE	1" = 200'
DATE	08/12/04
W.O.	2794-1
GROSS AREA	206.8 AC±
CONTOUR INTERVAL	1'
TOTAL LOTS	474 RESIDENTIAL
	516 TOTAL LOTS

PREPARED FOR:
Woodside Homes
23121 Antonio Parkway #120
Rancho Santa Margarita, CA 92688
Tel: (949) 858-4984

PREPARED BY:
H&A
HUNSAKER & ASSOCIATES IRVINE, INC.
PLANNING • ENGINEERING • SURVEYING
Three Hughes, Irvine, CA 92618-19
PH: (949) 583-1010 FX: (949) 583-0759

Amendment #3
TENTATIVE TRACT NO. 31194

SHEET 1 OF 2

APPROVED

WO: 2794-1 TTM 31194 DOC: 6225 RM: 269 BIN: 251 B

P:\0042\Planning\DA_Project\TTM\TTM-31194-Sht1.dwg

MAP DATE IDENTIFIER
DATE OF LATEST CHANGE TO THIS MAP
01/10/07 BY: JAC
DATE OF THIS PLOT
01/10/07

NORTH

0 50' 100' 200'

SCALE	1" = 100'
DATE	08/12/04
W.O.	2794-1
GROSS AREA	206.8 AC±
CONTOUR INTERVAL	1'
TOTAL LOTS	474 RESIDENTIAL 516 TOTAL LOTS

NOTE:
ALL SECTIONS ARE LOCATED ON SHEET 1 OF 2

OWNER:
Pleasant Valley Investments
23121 Antonio Parkway #120
Rancho Santa Margarita, CA 92688
Tel: (949) 858-4984

PREPARED FOR:
Woodside Homes
23121 Antonio Parkway #120
Rancho Santa Margarita, CA 92688
Tel: (949) 858-4984

PREPARED BY:
H&A
HUNSAKER & ASSOCIATES
IRVINE, INC.
PLANNING • ENGINEERING • SURVEYING
Three Hughes Irvine, CA 92618
FX: (949) 583-0759 PH: (949) 583-1010

Amendment #3
TENTATIVE TRACT NO. 31194

SHEET 2 OF 2

WO: 2794-1 TTM 31194 BIN: 251 B RM: 269 DOC: ~~6773~~ 66015
APPROVED 4-10-07

F:\0042\Planning\0A_Project\TTM\TTM-31194-Sht2.dwg

NO LABORATORY RESULTS

APPENDIX E

REGULATORY DATABASE REPORT

Golden Meadows
Golden Meadows
Menifee, CA 92584

Inquiry Number: 03494433.2r
January 14, 2013

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

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Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	8
Orphan Summary	13
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting SSURGO Soil Map	A-5
Physical Setting Source Map	A-21
Physical Setting Source Map Findings	A-23
Physical Setting Source Records Searched	A-27

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

GOLDEN MEADOWS
MENIFEE, CA 92584

COORDINATES

Latitude (North):	33.6526000 - 33° 39' 9.36''
Longitude (West):	117.1900000 - 117° 11' 24.00''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	482382.4
UTM Y (Meters):	3723461.0
Elevation:	1539 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	33117-F2 ROMOLAND, CA
Most Recent Revision:	1979

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	2009, 2010
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List

EXECUTIVE SUMMARY

Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP ---------- CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls
LUCIS ---------- Land Use Control Information System

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE ---------- State Response Sites

State- and tribal - equivalent CERCLIS

ENVIROSTOR ---------- EnviroStor Database

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Information System

State and tribal leaking storage tank lists

SLIC ---------- Statewide SLIC Cases

INDIAN LUST - Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST - Active UST Facilities
AST - Aboveground Petroleum Storage Tank Facilities
INDIAN UST - Underground Storage Tanks on Indian Land
FEMA UST - Underground Storage Tank Listing

State and tribal voluntary cleanup sites

INDIAN VCP - Voluntary Cleanup Priority Listing
VCP - Voluntary Cleanup Program Properties

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS - A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9 - Torres Martinez Reservation Illegal Dump Site Locations
ODI - Open Dump Inventory
WMUDS/SWAT - Waste Management Unit Database
SWRCY - Recycler Database
HAULERS - Registered Waste Tire Haulers Listing
INDIAN ODI - Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL - Clandestine Drug Labs
HIST Cal-Sites - Historical Calsites Database
SCH - School Property Evaluation Program
Toxic Pits - Toxic Pits Cleanup Act Sites
CDL - Clandestine Drug Labs
US HIST CDL - National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

CA FID UST - Facility Inventory Database
HIST UST - Hazardous Substance Storage Container Database
SWEEPS UST - SWEEPS UST Listing

Local Land Records

LIENS 2 - CERCLA Lien Information
LIENS - Environmental Liens Listing
DEED - Deed Restriction Listing

Records of Emergency Release Reports

HMIRS - Hazardous Materials Information Reporting System
CHMIRS - California Hazardous Material Incident Report System

LDS Land Disposal Sites Listing
MCS Military Cleanup Sites Listing

Other Ascertainable Records

RCRA NonGen / NLR RCRA - Non Generators
DOT OPS Incident and Accident Data
DOD Department of Defense Sites
FUDS Formerly Used Defense Sites
CONSENT Superfund (CERCLA) Consent Decrees
ROD Records Of Decision
UMTRA Uranium Mill Tailings Sites
MINES Mines Master Index File
TRIS Toxic Chemical Release Inventory System
TSCA Toxic Substances Control Act
FTTS FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS FIFRA/TSCA Tracking System Administrative Case Listing
SSTS Section 7 Tracking Systems
ICIS Integrated Compliance Information System
PADS PCB Activity Database System
MLTS Material Licensing Tracking System
RADINFO Radiation Information Database
FINDS Facility Index System/Facility Registry System
RAATS RCRA Administrative Action Tracking System
RMP Risk Management Plans
CA BOND EXP. PLAN Bond Expenditure Plan
NPDES NPDES Permits Listing
UIC UIC Listing
Cortese "Cortese" Hazardous Waste & Substances Sites List
CUPA Listings CUPA Resources List
Notify 65 Proposition 65 Records
DRYCLEANERS Cleaner Facilities
WIP Well Investigation Program Case List
ENF Enforcement Action Listing
HAZNET Facility and Manifest Data
EMI Emissions Inventory Data
INDIAN RESERV Indian Reservations
SCRD DRYCLEANERS State Coalition for Remediation of Drycleaners Listing
EPA WATCH LIST EPA WATCH LIST
WDS Waste Discharge System
US AIRS Aerometric Information Retrieval System Facility Subsystem
PRP Potentially Responsible Parties
US FIN ASSUR Financial Assurance Information
2020 COR ACTION 2020 Corrective Action Program List
PCB TRANSFORMER PCB Transformer Registration Database
PROC Certified Processors Database
MWMP Medical Waste Management Program Listing
COAL ASH DOE Steam-Electric Plant Operation Data
COAL ASH EPA Coal Combustion Residues Surface Impoundments List
HWT Registered Hazardous Waste Transporter Database
HWP EnviroStor Permitted Facilities Listing
Financial Assurance Financial Assurance Information Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR US Hist Auto Stat ------- EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners ------- EDR Exclusive Historic Dry Cleaners

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 10/17/2012 has revealed that there is 1 LUST site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MENIFEE UNION SCHOOL DIST.	***26301 GARBONI RD***	***WNW 1/4 - 1/2 (0.263 mi.)***	***A2***	***9***
Status: Completed - Case Closed				

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

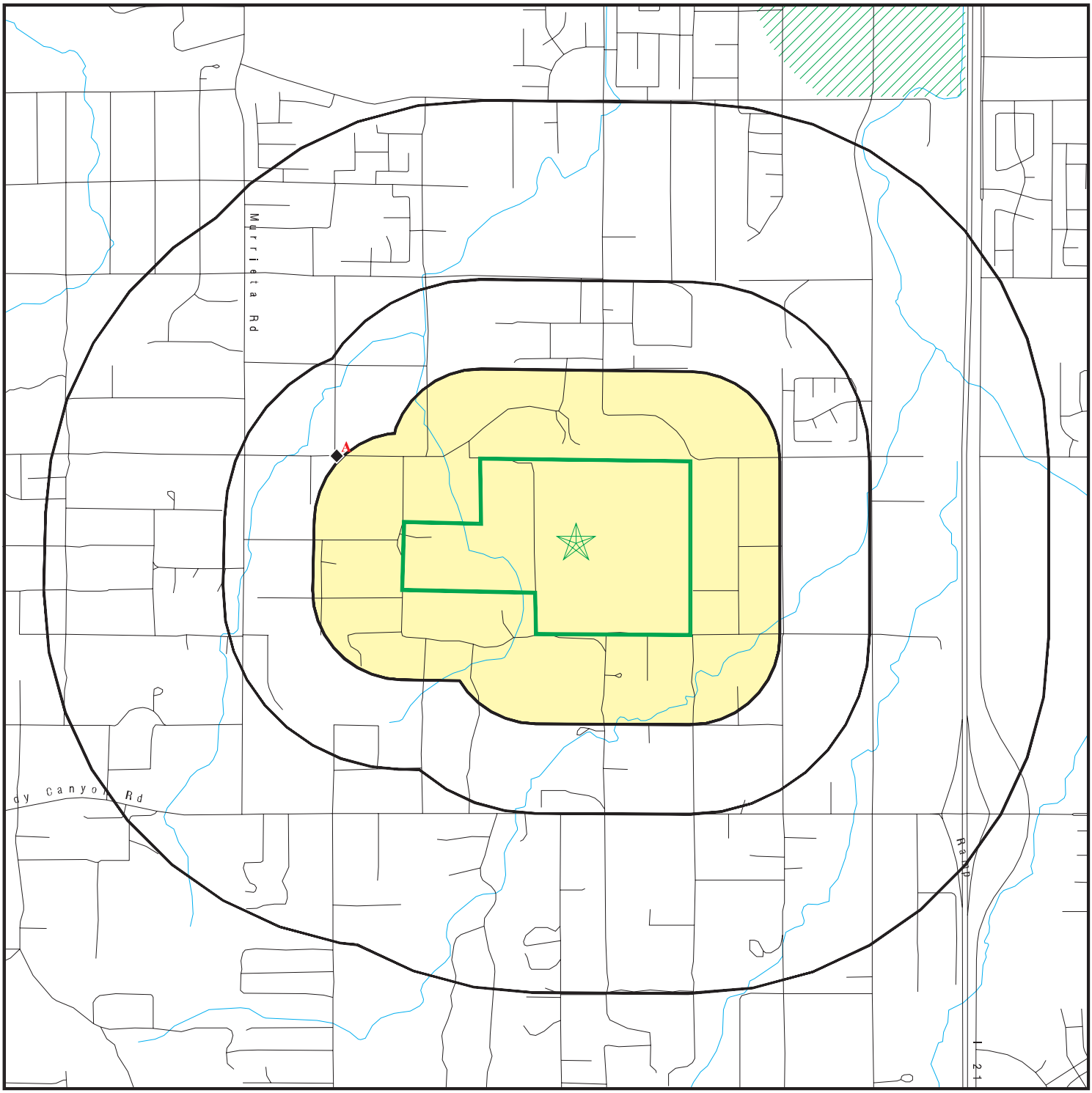
A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there is 1 HIST CORTESE site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MAINTENANCE OPERATIONS & TRA	***26301 GARBANI RD***	***WNW 1/4 - 1/2 (0.263 mi.)***	***A1***	***8***

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 03494433.2r



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Golden Meadows ADDRESS: Golden Meadows Menifee CA 92584 LAT/LONG: 33.6526 / 117.19	CLIENT: Hillmann Environmental Co. CONTACT: Kristi Hill INQUIRY #: 03494433.2r DATE: January 14, 2013 2:52 pm

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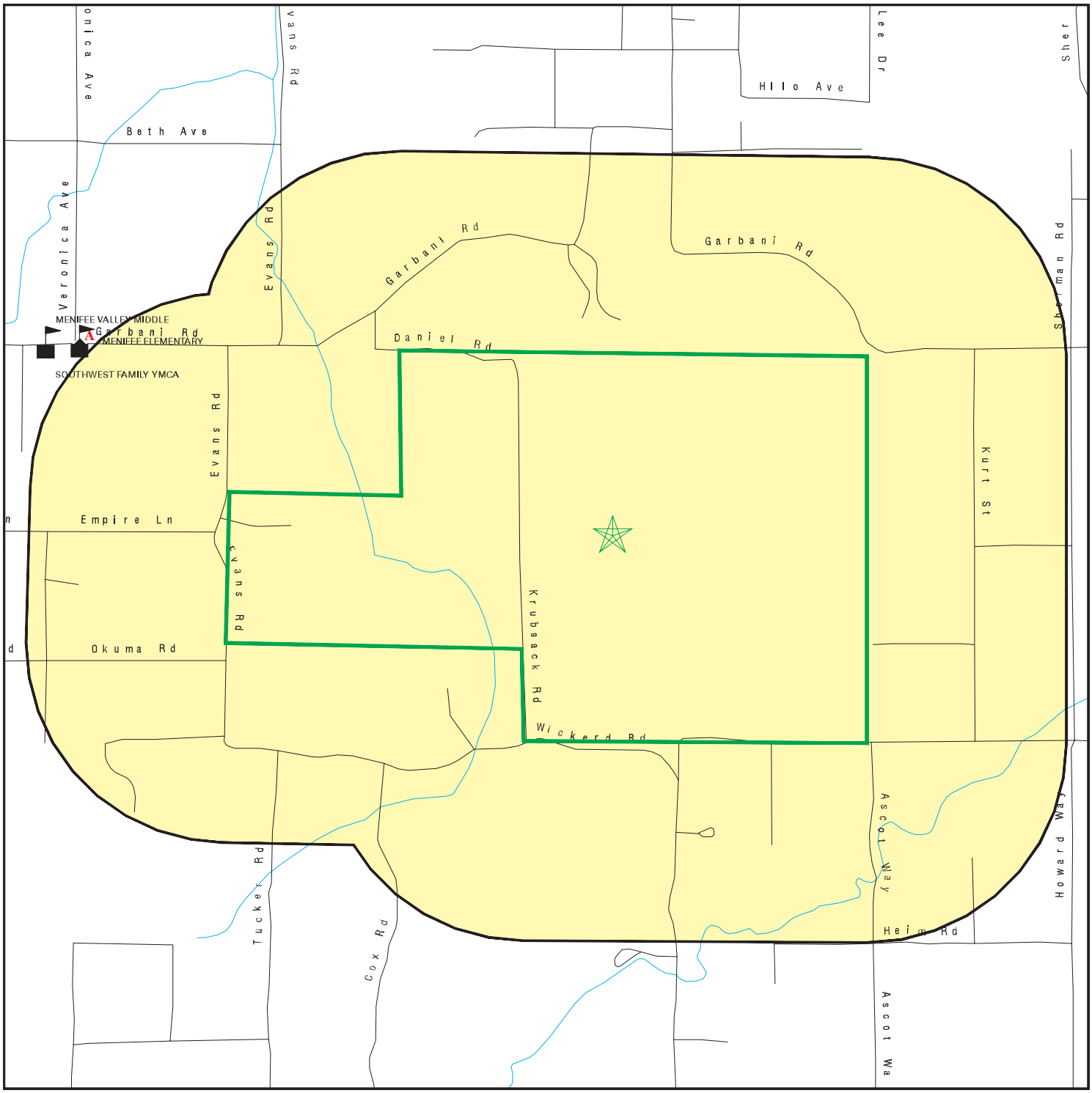
DETAIL MAP - 03494433.2r



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Golden Meadows	CLIENT: Hillmann Environmental Co.
ADDRESS: Golden Meadows Menifee CA 92584	CONTACT: Kristi Hill INQUIRY #: 03494433.2r
LAT/LONG: 33.6526 / 117.19	DATE: January 14, 2013 2:56 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500		0	0	0	NR	NR	0
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	1	NR	NR	1

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SLIC	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
CA FID UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	0	NR	NR	NR	0
SWEEPS UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
LIENS	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MCS	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
Cortese	0.500		0	0	0	NR	NR	0
HIST CORTESE	0.500		0	0	1	NR	NR	1
CUPA Listings	0.250		0	0	NR	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
HWT	0.250		0	0	NR	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		0	0	NR	NR	NR	0
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 **MAINTENANCE OPERATIONS & TRA** **NPDES** **S103978701**
WNW **26301 GARBANI RD** **HIST CORTESE** **N/A**
1/4-1/2 **MENIFEE, CA 92584** **HAZNET**
0.263 mi. **WDS**
1391 ft. **Site 1 of 2 in cluster A**

Relative:
Lower

Actual:
1517 ft.

NPDES:

Npdes Number:	CAS000001
Facility Status:	Active
Agency Id:	0
Region:	8
Regulatory Measure Id:	210957
Order No:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	8 33I017951
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	03/13/2003
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Menifee School Union Dist
Discharge Address:	30205 Menifee Rd
Discharge City:	Menifee
Discharge State:	California
Discharge Zip:	92584

CORTESE:

Region:	CORTESE
Facility County Code:	33
Reg By:	LTNKA
Reg Id:	083302792T

HAZNET:

Year:	1998
Gepaid:	CAC001423160
Contact:	MENIFEE UNIFIED SCHOOL DIST
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	30205 MENIFEE RD
Mailing City,St,Zip:	MENIFEE, CA 925840000
Gen County:	Riverside
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Unspecified oil-containing waste
Disposal Method:	Recycler
Tons:	7.0890
Facility County:	Riverside

CA WDS:

Facility ID:	Santa Ana River 33I017951
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is

MAINTENANCE OPERATIONS & TRA (Continued) **S103978701**

	under Waste Discharge Requirements.
NPDES Number:	CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board
Subregion:	8
Facility Telephone:	9096796833
Facility Contact:	BROWN DAVID
Agency Name:	MENIFEE UNION SCHOOL DISTRICT
Agency Address:	30205 MENIFEE ROAD
Agency City,St,Zip:	MENIFEE 92584
Agency Contact:	DAN WOOD
Agency Telephone:	Not reported
Agency Type:	Special District (Includes districts established under general acts, sanitary districts, water districts irrigation districts, etc.)
SIC Code:	0
SIC Code 2:	Not reported
Primary Waste:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	Not reported
POTW:	Not reported
Treat To Water:	Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.
Complexity:	Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

A2 **MENIFEE UNION SCHOOL DIST.** **NPDES** **U002244632**
WNW **26301 GARBONI RD** **LUST** **N/A**
1/4-1/2 **MENIFEE, CA 92058**
0.263 mi.
1391 ft. **Site 2 of 2 in cluster A**

Relative:
Lower

Actual:
1517 ft.

NPDES:

Npdes Number:	CAS000002
Facility Status:	Terminated
Agency Id:	0
Region:	8
Regulatory Measure Id:	351567
Order No:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	8 33C353243
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	09/02/2008
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	10/25/2010
Discharge Name:	Menifee Union School District

MENIFEE UNION SCHOOL DIST. (Continued) **U002244632**

Discharge Address:	30205 Menifee Rd
Discharge City:	Menifee
Discharge State:	California
Discharge Zip:	92584

LUST:

Region:	STATE
Global Id:	T0606500451
Latitude:	33.6591486
Longitude:	-117.1886961
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	11/04/2003
Lead Agency:	RIVERSIDE COUNTY LOP
Case Worker:	UNK
Local Agency:	RIVERSIDE COUNTY LOP
RB Case Number:	083302792T
LOC Case Number:	96091
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

LUST:

Global Id:	T0606500451
Contact Type:	Regional Board Caseworker
Contact Name:	CARL BERNHARDT
Organization Name:	SANTA ANA RWQCB (REGION 8)
Address:	3737 MAIN STREET, SUITE 500
City:	RIVERSIDE
Email:	cbernhardt@waterboards.ca.gov
Phone Number:	9517824495

Global Id:	T0606500451
Contact Type:	Local Agency Caseworker
Contact Name:	UNK
Organization Name:	RIVERSIDE COUNTY LOP
Address:	4065 COUNTY CIRCLE DR ROOM 123
City:	RIVERSIDE
Email:	Not reported
Phone Number:	Not reported

LUST:

Global Id:	T0606500451
Action Type:	Other
Date:	01/01/1950
Action:	Leak Reported

Global Id:	T0606500451
Action Type:	ENFORCEMENT
Date:	12/30/2002
Action:	Technical Correspondence / Assistance / Other

Global Id:	T0606500451
Action Type:	Other

MENIFEE UNION SCHOOL DIST. (Continued) **U002244632**

Date: 01/01/1950
Action: Leak Stopped

Global Id: T0606500451
Action Type: Other
Date: 01/01/1950
Action: Leak Discovery

LUST REG 8:
Region: 8
County: Riverside
Regional Board: Santa Ana Region
Facility Status: Case Closed
Case Number: 083302792T
Local Case Num: 96091
Case Type: Aquifer affected
Substance: Gasoline
Qty Leaked: Not reported
Abate Method: Not reported
Cross Street: MENIFEE
Enf Type: TA-CLO
Funding: Not reported
How Discovered: Tank Closure
How Stopped: Not reported
Leak Cause: UNK
Leak Source: Tank
Global ID: T0606500451
How Stopped Date: 1/31/1996
Enter Date: 3/19/1996
Review Date: 1/31/1996
Prelim Assess: 6/17/1996
Discover Date: 1/31/1996
Enforcement Date: Not reported
Close Date: 11/4/2003
Workplan: 4/30/1996
Pollution Char: 9/12/1996
Remed Plan: Not reported
Remed Action: Not reported
Monitoring: Not reported
Enter Date: 3/19/1996
GW Qualifies: Not reported
Soil Qualifies: Not reported
Operator: Not reported
Facility Contact: Not reported
Interim: Not reported
Oversite Program: LUST
Latitude: 33.6591486
Longitude: -117.1886961
MTBE Date: Not reported
Max MTBE GW: Not reported
MTBE Concentration: 0
Max MTBE Soil: Not reported
MTBE Fuel: 1
MTBE Tested: Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
MTBE Class: *
Staff: CAB

MENIFEE UNION SCHOOL DIST. (Continued) **U002244632**

Staff Initials: UNK
Lead Agency: Local Agency
Local Agency: 33000L
Hydr Basin #: SAN JACINTO (8-5)
Beneficial: Not reported
Priority: Not reported
Cleanup Fund Id: Not reported
Work Suspended: Not reported
Summary: Not reported

RIVERSIDE CO. LUST:
Region: RIVERSIDE
Facility ID: 96091
Employee: Winters
Site Closed: Yes
Case Type: Drinking Water Aquifer affected
Facility Status: closed/action completed

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 11/02/2012
Date Data Arrived at EDR: 11/28/2012
Date Made Active in Reports: 01/07/2013
Number of Days to Update: 40

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 10/09/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/11/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 11/02/2012
Date Data Arrived at EDR: 11/28/2012
Date Made Active in Reports: 01/07/2013
Number of Days to Update: 40

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 08/19/2011
Date Data Arrived at EDR: 08/31/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 132

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 07/18/2012
Date Data Arrived at EDR: 07/24/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 104

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 07/18/2012
Date Data Arrived at EDR: 07/24/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 104

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/15/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 04/02/2012
Date Data Arrived at EDR: 04/03/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 72

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 01/11/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/06/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 24

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/06/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/06/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 24

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/06/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/19/2012
Date Data Arrived at EDR: 11/19/2012
Date Made Active in Reports: 01/04/2013
Number of Days to Update: 46

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 11/19/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 10/17/2012
Date Data Arrived at EDR: 10/18/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 20

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 12/17/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 10/17/2012
Date Data Arrived at EDR: 10/18/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 20

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/17/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 08/01/2012
Date Data Arrived at EDR: 08/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 75

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/30/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/12/2012
Date Data Arrived at EDR: 05/09/2012
Date Made Active in Reports: 07/10/2012
Number of Days to Update: 62

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/07/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 10/17/2012
Date Data Arrived at EDR: 10/18/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 20

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 12/18/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
Registered Aboveground Storage Tanks.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 916-327-5092
Last EDR Contact: 01/07/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 08/01/2012
Date Data Arrived at EDR: 08/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 75

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/07/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 39

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 08/02/2012
Date Data Arrived at EDR: 08/03/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 94

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/12/2012
Date Data Arrived at EDR: 05/02/2012
Date Made Active in Reports: 07/16/2012
Number of Days to Update: 75

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/14/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/06/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 24
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/06/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 14
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/10/2012
Date Data Arrived at EDR: 12/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 9
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/03/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: No Update Planned

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30
Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 09/17/2012
Date Data Arrived at EDR: 09/19/2012
Date Made Active in Reports: 10/12/2012
Number of Days to Update: 23
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/20/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 11/15/2012
Date Data Arrived at EDR: 11/20/2012
Date Made Active in Reports: 01/04/2013
Number of Days to Update: 45
Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 12/14/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/05/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 07/11/2012
Date Data Arrived at EDR: 09/12/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 54

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 12/03/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Quarterly

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/06/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 24

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/06/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2012
Date Data Arrived at EDR: 09/12/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 21

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Lists of Registered Storage Tanks

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 12/03/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/16/2012
Date Data Arrived at EDR: 03/26/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 09/18/2012
Date Data Arrived at EDR: 09/19/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 14

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 09/10/2012
Date Data Arrived at EDR: 09/11/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 22

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 04/01/2012
Date Data Arrived at EDR: 04/03/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 72

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 03/28/2012
Date Data Arrived at EDR: 05/01/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 24

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 11/02/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 10/17/2012
Date Data Arrived at EDR: 10/18/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 20

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/17/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 10/17/2012
Date Data Arrived at EDR: 10/18/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 20

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/17/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 11/06/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/18/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 08/12/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 112

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/19/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 62

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 02/27/2012
Date Data Arrived at EDR: 03/14/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 92

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/28/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/18/2011
Date Data Arrived at EDR: 09/08/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 21

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 12/05/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 09/01/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 131

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/28/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/19/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 11/10/2010
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 98

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/19/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/21/2011
Date Data Arrived at EDR: 07/15/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 60

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/02/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/09/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 10/23/2011
Date Data Arrived at EDR: 12/13/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 79

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/08/2012
Date Data Arrived at EDR: 05/25/2012
Date Made Active in Reports: 07/10/2012
Number of Days to Update: 46
Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62
Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/30/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Biennially

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6
Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 08/20/2012
Date Data Arrived at EDR: 08/20/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 44
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/19/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Quarterly

UIC: UIC Listing

A listing of underground control injection wells.

Date of Government Version: 08/14/2012
Date Data Arrived at EDR: 09/19/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 14
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/21/2012
Next Scheduled EDR Contact: 12/31/2012
Data Release Frequency: Varies

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 10/23/2012
Number of Days to Update: 21

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/18/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: No Update Planned

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 12/11/2012
Date Data Arrived at EDR: 12/12/2012
Date Made Active in Reports: 01/04/2013
Number of Days to Update: 23

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 12/24/2012
Data Release Frequency: Annually

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 08/15/2011
Date Data Arrived at EDR: 08/23/2011
Date Made Active in Reports: 10/03/2011
Number of Days to Update: 41

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/15/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 06/22/2012
Date Made Active in Reports: 07/06/2012
Number of Days to Update: 14

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 10/15/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 10/18/2010
Number of Days to Update: 19

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/18/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 08/20/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 11/16/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Quarterly

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/02/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 09/17/2012
Date Data Arrived at EDR: 09/19/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 14

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/20/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/12/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 21

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 10/16/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 10/15/2012
Date Data Arrived at EDR: 10/16/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 22

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/16/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Quarterly

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/26/2012
Date Data Arrived at EDR: 11/28/2012
Date Made Active in Reports: 01/09/2013
Number of Days to Update: 42

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/28/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/19/2012
Date Data Arrived at EDR: 11/20/2012
Date Made Active in Reports: 01/04/2013
Number of Days to Update: 45

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 11/16/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 03/01/2007
Date Data Arrived at EDR: 06/01/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 28

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 11/02/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

2020 COR ACTION: 2020 Corrective Action Program List
The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 08/16/2012
Next Scheduled EDR Contact: 11/26/2012
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands
Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/18/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: N/A

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 32

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 01/18/2012
Date Data Arrived at EDR: 01/27/2012
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 34

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 01/18/2012
Date Data Arrived at EDR: 01/27/2012
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 34

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

EPA WATCH LIST: EPA WATCH LIST
EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/13/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 10/09/2012
Date Data Arrived at EDR: 10/12/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 26

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 10/09/2012
Date Data Arrived at EDR: 10/12/2012
Date Made Active in Reports: 10/24/2012
Number of Days to Update: 12

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Semi-Annually

BUTTE COUNTY:

CUPA Facility Listing
Cupa facility list.

Date of Government Version: 10/16/2012
Date Data Arrived at EDR: 10/17/2012
Date Made Active in Reports: 11/13/2012
Number of Days to Update: 27

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 01/14/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Varies

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 08/16/2012
Date Data Arrived at EDR: 08/22/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 42

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 01/02/2013
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 10/10/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 27

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 11/05/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Semi-Annually

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 08/20/2012
Date Data Arrived at EDR: 08/22/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 42

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 11/05/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 09/30/2012
Date Data Arrived at EDR: 10/05/2012
Date Made Active in Reports: 10/23/2012
Number of Days to Update: 18

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 01/14/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 09/10/2012
Date Data Arrived at EDR: 09/11/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 22

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 05/01/2012
Date Data Arrived at EDR: 05/02/2012
Date Made Active in Reports: 06/11/2012
Number of Days to Update: 40

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/04/2012
Next Scheduled EDR Contact: 11/12/2012
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/26/2012
Date Data Arrived at EDR: 06/27/2012
Date Made Active in Reports: 08/17/2012
Number of Days to Update: 51

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 08/31/2010
Date Data Arrived at EDR: 09/01/2010
Date Made Active in Reports: 09/30/2010
Number of Days to Update: 29

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county?s Certified Unified Program Agency database. California?s Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 07/10/2012
Date Data Arrived at EDR: 07/12/2012
Date Made Active in Reports: 09/06/2012
Number of Days to Update: 56

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206
Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 12/18/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 06/28/2012
Date Data Arrived at EDR: 09/25/2012
Date Made Active in Reports: 10/23/2012
Number of Days to Update: 28
Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 07/16/2012
Next Scheduled EDR Contact: 10/26/2012
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/22/2012
Date Data Arrived at EDR: 10/23/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 38
Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 10/23/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29
Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 11/16/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 12/29/2011
Date Data Arrived at EDR: 02/02/2012
Date Made Active in Reports: 02/21/2012
Number of Days to Update: 19
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 10/23/2012
Date Data Arrived at EDR: 10/25/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 36
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/28/2003
Date Data Arrived at EDR: 10/23/2003
Date Made Active in Reports: 11/26/2003
Number of Days to Update: 34
Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 10/15/2012
Date Data Arrived at EDR: 10/19/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 19

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 01/14/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List
A listing of sites included in the county?s Certified Unified Program Agency database. California?s Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 09/17/2012
Date Data Arrived at EDR: 09/18/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 15

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 07/24/2012
Date Data Arrived at EDR: 07/31/2012
Date Made Active in Reports: 09/14/2012
Number of Days to Update: 45

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 01/07/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 09/18/2012
Date Data Arrived at EDR: 09/19/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 14

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 12/18/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 09/18/2012
Date Data Arrived at EDR: 09/18/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 15

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 12/03/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 12/05/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/06/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 24
Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 11/05/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/16/2012
Date Made Active in Reports: 12/03/2012
Number of Days to Update: 17
Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/16/2012
Date Made Active in Reports: 12/03/2012
Number of Days to Update: 17
Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/05/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/15/2012
Date Made Active in Reports: 12/03/2012
Number of Days to Update: 18
Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

PLACER COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 09/05/2012
Date Data Arrived at EDR: 09/11/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 22

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/16/2012
Date Data Arrived at EDR: 10/18/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 20

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/26/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/16/2012
Date Data Arrived at EDR: 10/18/2012
Date Made Active in Reports: 11/07/2012
Number of Days to Update: 20

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/26/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 08/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 11/02/2012
Number of Days to Update: 22

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/07/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 08/08/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 11/13/2012
Number of Days to Update: 33

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/07/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 08/29/2012
Date Data Arrived at EDR: 08/30/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 34

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/20/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 44

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 01/02/2013
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2012
Date Data Arrived at EDR: 11/06/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 24

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 09/24/2012
Date Data Arrived at EDR: 09/25/2012
Date Made Active in Reports: 10/23/2012
Number of Days to Update: 28

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 01/07/2013
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 09/24/2012
Date Data Arrived at EDR: 09/25/2012
Date Made Active in Reports: 11/02/2012
Number of Days to Update: 38

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 10/17/2012
Date Data Arrived at EDR: 10/19/2012
Date Made Active in Reports: 11/13/2012
Number of Days to Update: 25

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/12/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 09/13/2012
Date Data Arrived at EDR: 09/18/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 15

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/12/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 01/11/2013
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

SANTA CLARA COUNTY:

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 09/04/2012
Date Data Arrived at EDR: 09/06/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 27

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 12/03/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/13/2012
Date Data Arrived at EDR: 11/14/2012
Date Made Active in Reports: 12/03/2012
Number of Days to Update: 19

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List

CUPA facility listing.

Date of Government Version: 08/23/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 36

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List

Cupa Facility List.

Date of Government Version: 08/22/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 36

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks

A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 09/14/2012
Date Data Arrived at EDR: 10/05/2012
Date Made Active in Reports: 10/23/2012
Number of Days to Update: 18

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/12/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 09/14/2012
Date Data Arrived at EDR: 10/09/2012
Date Made Active in Reports: 10/23/2012
Number of Days to Update: 14

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/12/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

SONOMA COUNTY:

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 10/02/2012
Date Data Arrived at EDR: 10/03/2012
Date Made Active in Reports: 10/23/2012
Number of Days to Update: 20

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/11/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 22

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Semi-Annually

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 03/30/2012
Date Data Arrived at EDR: 05/25/2012
Date Made Active in Reports: 07/06/2012
Number of Days to Update: 42

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 11/21/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/07/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 11/15/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Quarterly

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 10/29/2012
Date Data Arrived at EDR: 11/06/2012
Date Made Active in Reports: 12/03/2012
Number of Days to Update: 27

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 09/20/2012
Date Made Active in Reports: 10/23/2012
Number of Days to Update: 33

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/17/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 10/02/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 10/23/2012
Number of Days to Update: 19

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 12/18/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 08/16/2012
Date Data Arrived at EDR: 08/16/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 48

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 11/05/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/19/2012
Date Data Arrived at EDR: 11/19/2012
Date Made Active in Reports: 01/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/19/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/16/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 11/07/2012
Date Made Active in Reports: 12/11/2012
Number of Days to Update: 34

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/07/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/23/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 57

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 06/22/2012
Date Made Active in Reports: 07/31/2012
Number of Days to Update: 39

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 09/27/2012
Number of Days to Update: 70

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/13/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

GOLDEN MEADOWS
GOLDEN MEADOWS
MENIFEE, CA 92584

TARGET PROPERTY COORDINATES

Latitude (North):	33.6526 - 33° 39' 9.36''
Longitude (West):	117.19 - 117° 11' 24.00''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	482382.4
UTM Y (Meters):	3723461.0
Elevation:	1539 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	33117-F2 ROMOLAND, CA
Most Recent Revision:	1979

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

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GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

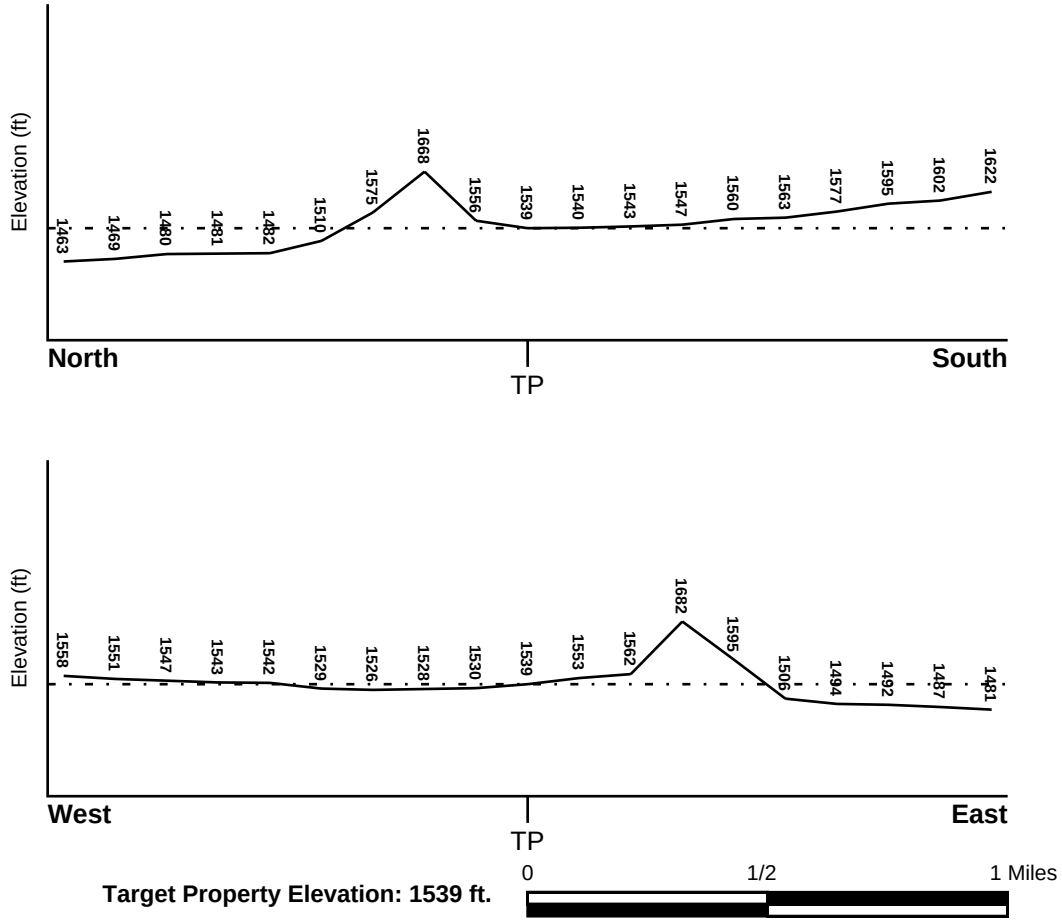
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 1539 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
RIVERSIDE, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 06065C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
5	1/2 - 1 Mile ESE	NNE

For additional site information, refer to Physical Setting Source Map Findings.

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

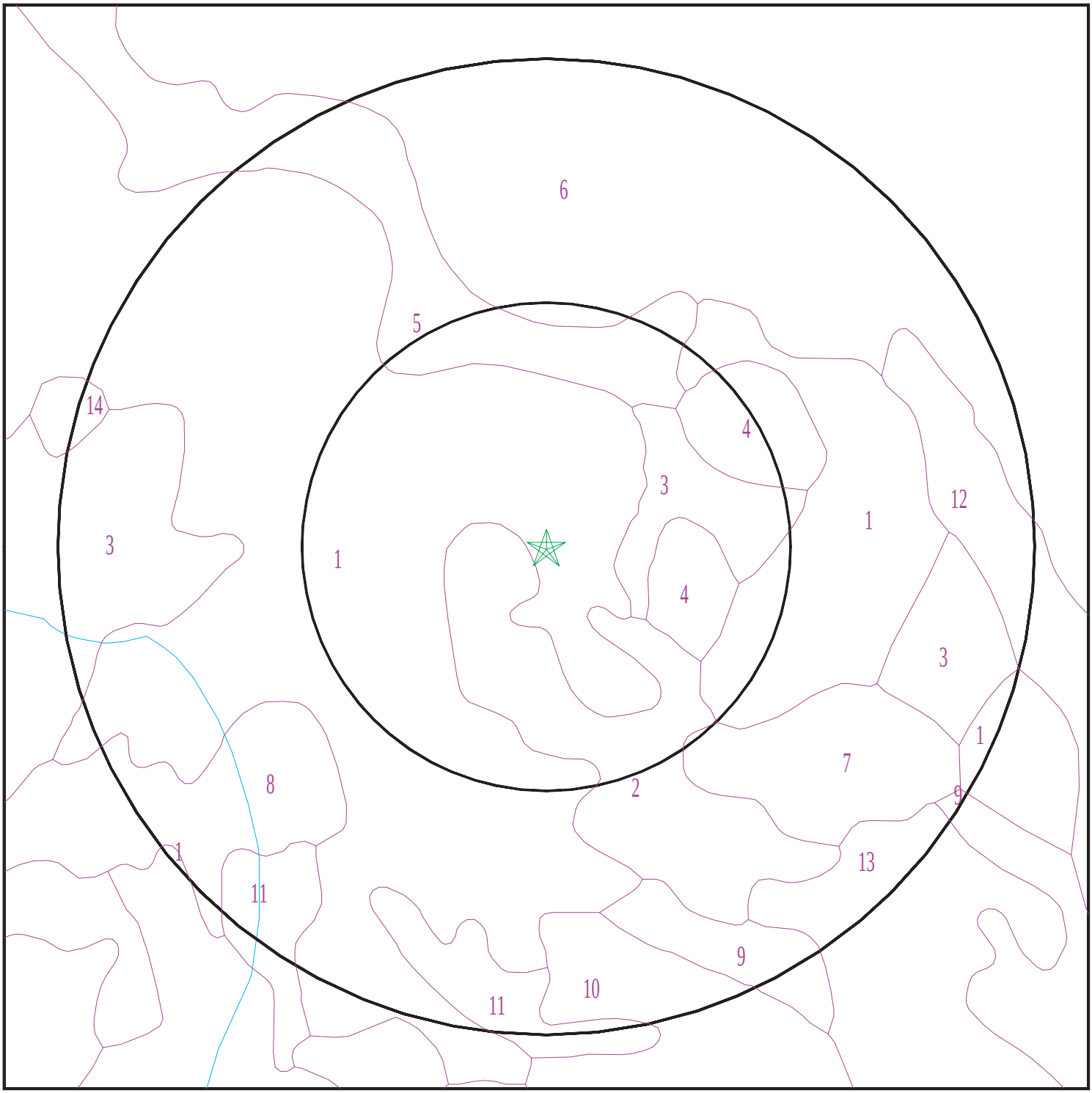
Era:	Mesozoic
System:	Cretaceous
Series:	Cretaceous granitic rocks
Code:	Kg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 03494433.2r



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Golden Meadows	CLIENT:	Hillmann Environmental Co.
ADDRESS:	Golden Meadows Menifee CA 92584	CONTACT:	Kristi Hill
		INQUIRY #:	03494433.2r
LAT/LONG:	33.6526 / 117.19	DATE:	January 14, 2013 2:57 pm

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DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: WYMAN

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6
2	14 inches	35 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6
3	35 inches	50 inches	stratified loam to clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	50 inches	59 inches	stratified loam to clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Map ID: 2

Soil Component Name: VALLECITOS

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 127 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 4 Min: 1.4	Max: Min:
2	7 inches	27 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 4 Min: 1.4	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	27 inches	48 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 4 Min: 1.4	Max: Min:
4	48 inches	51 inches	unweathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 4 Min: 1.4	Max: Min:

Soil Map ID: 3

Soil Component Name: YOKOHL

Soil Surface Texture: loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	9 inches	25 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6
3	25 inches	29 inches	indurated	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6
4	29 inches	59 inches	stratified sandy loam to gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6

Soil Map ID: 4

Soil Component Name: LAS POSAS

Soil Surface Texture: stony loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	stony loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
2	11 inches	25 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	25 inches	53 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 5

Soil Component Name: HONCUT

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 6.1
2	22 inches	59 inches	coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 6.1

Soil Map ID: 6

Soil Component Name: LAS POSAS

Soil Surface Texture: stony loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	stony loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	5 inches	20 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	20 inches	24 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 7

Soil Component Name: PORTERVILLE

Soil Surface Texture: clay

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.01	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	7 inches	35 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.01	Max: Min:
3	35 inches	40 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.01	Max: Min:

Soil Map ID: 8

Soil Component Name: HONCUT

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 6.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	22 inches	59 inches	coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 6.1

Soil Map ID: 9

Soil Component Name: CAJALCO

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
2	12 inches	22 inches	loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	22 inches	61 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 10

Soil Component Name: CAJALCO

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
2	12 inches	18 inches	loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	18 inches	61 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 11

Soil Component Name: YOKOHL

Soil Surface Texture: loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6
2	5 inches	20 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	20 inches	24 inches	indurated	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6
4	24 inches	59 inches	stratified sandy loam to gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6

Soil Map ID: 12

Soil Component Name: LAS POSAS

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	29 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	29 inches	53 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 13

Soil Component Name: CAJALCO

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	12 inches	29 inches	loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	29 inches	61 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 14

Soil Component Name: CIENEBA

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	14 inches	22 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS3125439	1/2 - 1 Mile WSW
2	USGS3125423	1/2 - 1 Mile SSW
A3	USGS3125295	1/2 - 1 Mile NNW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

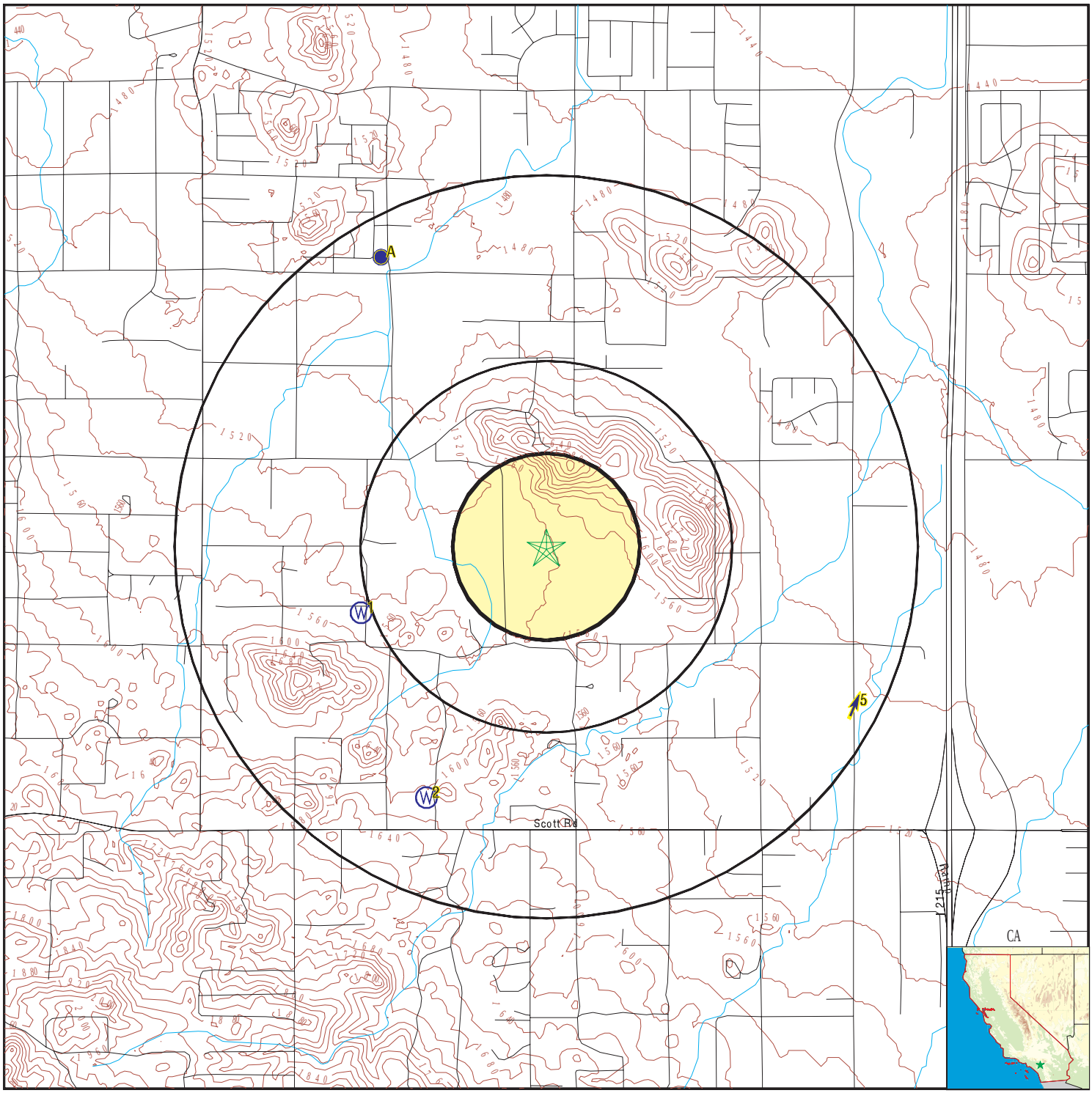
MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A4	CADW40000004944	1/2 - 1 Mile NNW

PHYSICAL SETTING SOURCE MAP - 03494433.2r



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Golden Meadows	CLIENT:	Hillmann Environmental Co.
ADDRESS:	Golden Meadows Menifee CA 92584	CONTACT:	Kristi Hill
		INQUIRY #:	03494433.2r
LAT/LONG:	33.6526 / 117.19	DATE:	January 14, 2013 2:57 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
WSW
1/2 - 1 Mile
Higher | **FED USGS** | **USGS3125439**

Agency cd:	USGS	Site no:	333900117115201
Site name:	006S003W16F001S		
Latitude:	333900	EDR Site id:	USGS3125439
Longitude:	1171152	Dec lat:	33.65002283
Dec lon:	-117.19864527	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	065
Country:	US	Land net:	Not Reported
Location map:	ROMOLAND	Map scale:	24000
Altitude:	1540		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	10		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Jacinto. California. Area = 757 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19931210	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	160	Hole depth:	Not Reported
Source of depth data:	owner		
Project number:	470648023		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1993-12-10
Water quality data end date:	1993-12-10	Water quality data count:	1
Ground water data begin date:	0000-00-00	Ground water data end date:	0000-00-00
Ground water data count:	0		

Ground-water levels, Number of Measurements: 0

2
SSW
1/2 - 1 Mile
Higher | **FED USGS** | **USGS3125423**

Agency cd:	USGS	Site no:	333834117114101
Site name:	006S003W16Q001S		
Latitude:	333834	EDR Site id:	USGS3125423
Longitude:	1171141	Dec lat:	33.64280083
Dec lon:	-117.19558954	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	065
Country:	US	Land net:	Not Reported
Location map:	ROMOLAND	Map scale:	24000

Altitude:	1600		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	5		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Jacinto. California. Area = 757 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19931210	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	470648023		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1993-12-10
Water quality data end date:	1993-12-10	Water quality data count:	1
Ground water data begin date:	0000-00-00	Ground water data end date:	0000-00-00
Ground water data count:	0		

Ground-water levels, Number of Measurements: 0

A3
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS3125295**

Agency cd:	USGS	Site no:	333950117114701
Site name:	006S003W09G001S		
Latitude:	333950	EDR Site id:	USGS3125295
Longitude:	1171147	Dec lat:	33.66391133
Dec lon:	-117.19725639	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	065
Country:	US	Land net:	*
Location map:	ROMOLAND	Map scale:	24000
Altitude:	1485		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	10		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Jacinto. California. Area = 757 sq.mi.		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19931210	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	Not Reported	Hole depth:	Not Reported
Source of depth data:	Not Reported		
Project number:	470648023		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count: 0
Water quality data end date: 1993-12-10
Ground water data begin date: 1993-12-10
Ground water data count: 1
Water quality data begin date: 1993-12-10
Water quality data count: 1
Ground water data end date: 1993-12-10

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1993-12-10	7.55	

Note: The site had been pumped recently.

A4
NNW
1/2 - 1 Mile
Lower

CA WELLS **CADW40000004944**

Longitude: -117.1973
Latiude: 33.6639
Stwellno: 06S03W09G001S
Districtco: 3
Welluseco: Z
Countyco: 33
Gwcode: 800500
Site id: CADW40000004944

5
ESE
1/2 - 1 Mile
Lower

AQUIFLOW **66385**

Site ID: 083303193T
Groundwater Flow: NNE
Shallow Water Depth: 13.23
Deep Water Depth: 17.15
Average Water Depth: Not Reported
Date: 03/26/1999

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92584	3	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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APPENDIX D

HISTORICAL RECORDS DOCUMENTATION

Wickerd Road

Wickerd Road

Menifee, CA 92584

Inquiry Number: 5010285.9

August 07, 2017

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

08/07/17

Site Name:

Wickerd Road
Wickerd Road
Menifee, CA 92584
EDR Inquiry # 5010285.9

Client Name:

Hillmann Environmental Co.
1745 W Orangewood Avenue
Orange, CA 92868-0000
Contact: Kristine Savona

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2010	1"=500'	Flight Year: 2010	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
2002	1"=500'	Acquisition Date: June 06, 2002	USGS/DOQQ
1996	1"=1000'	Flight Date: January 01, 1996	USGS
1985	1"=1000'	Flight Date: January 01, 1985	USDA
1978	1"=1000'	Flight Date: January 01, 1978	USDA
1967	1"=1000'	Flight Date: January 01, 1967	USDA
1961	1"=1000'	Flight Date: January 01, 1961	USDA
1953	1"=1000'	Flight Date: January 01, 1953	USDA
1938	1"=1000'	Flight Date: January 01, 1938	USDA

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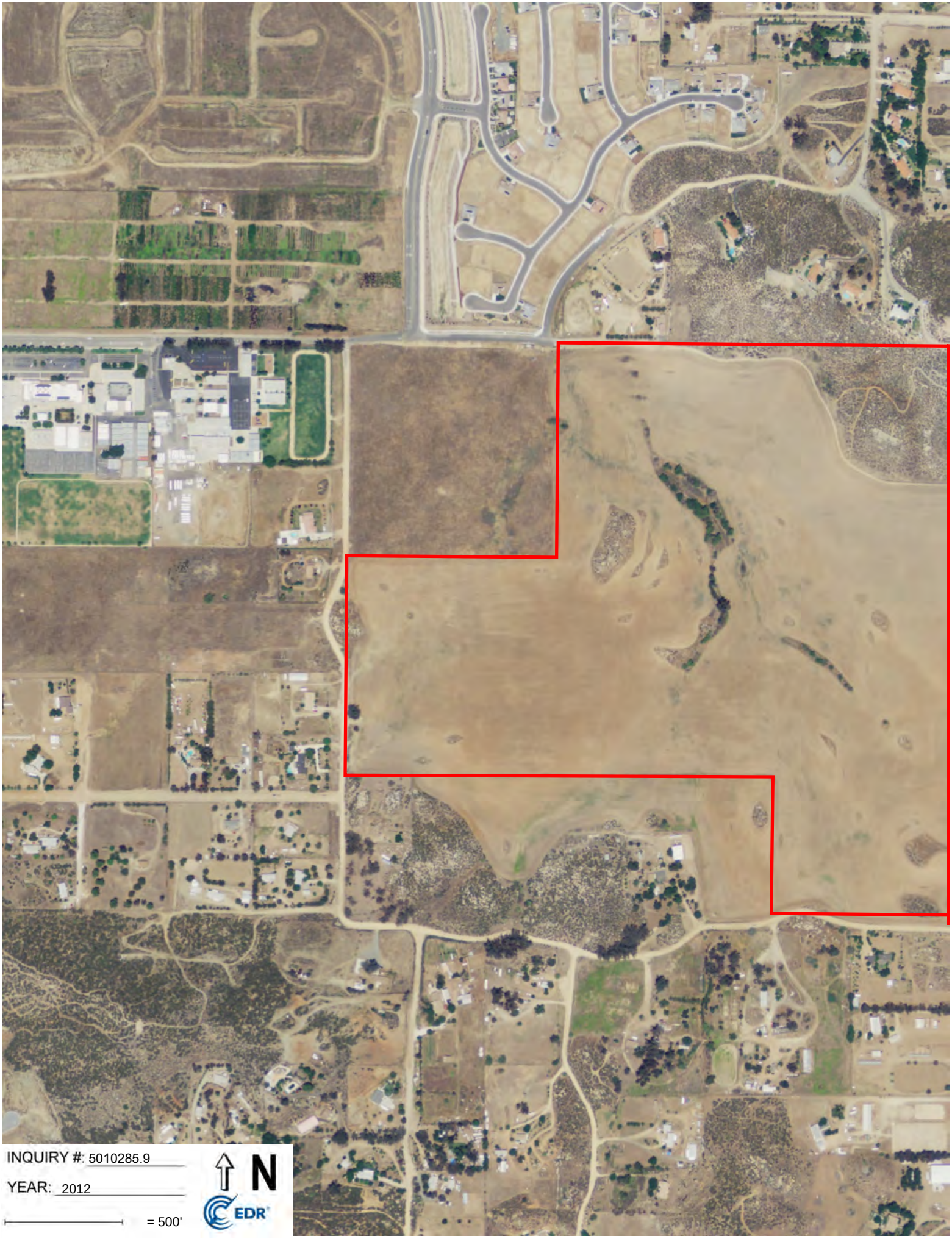
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EDR

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= 500'
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EDR

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= 500'
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EDR

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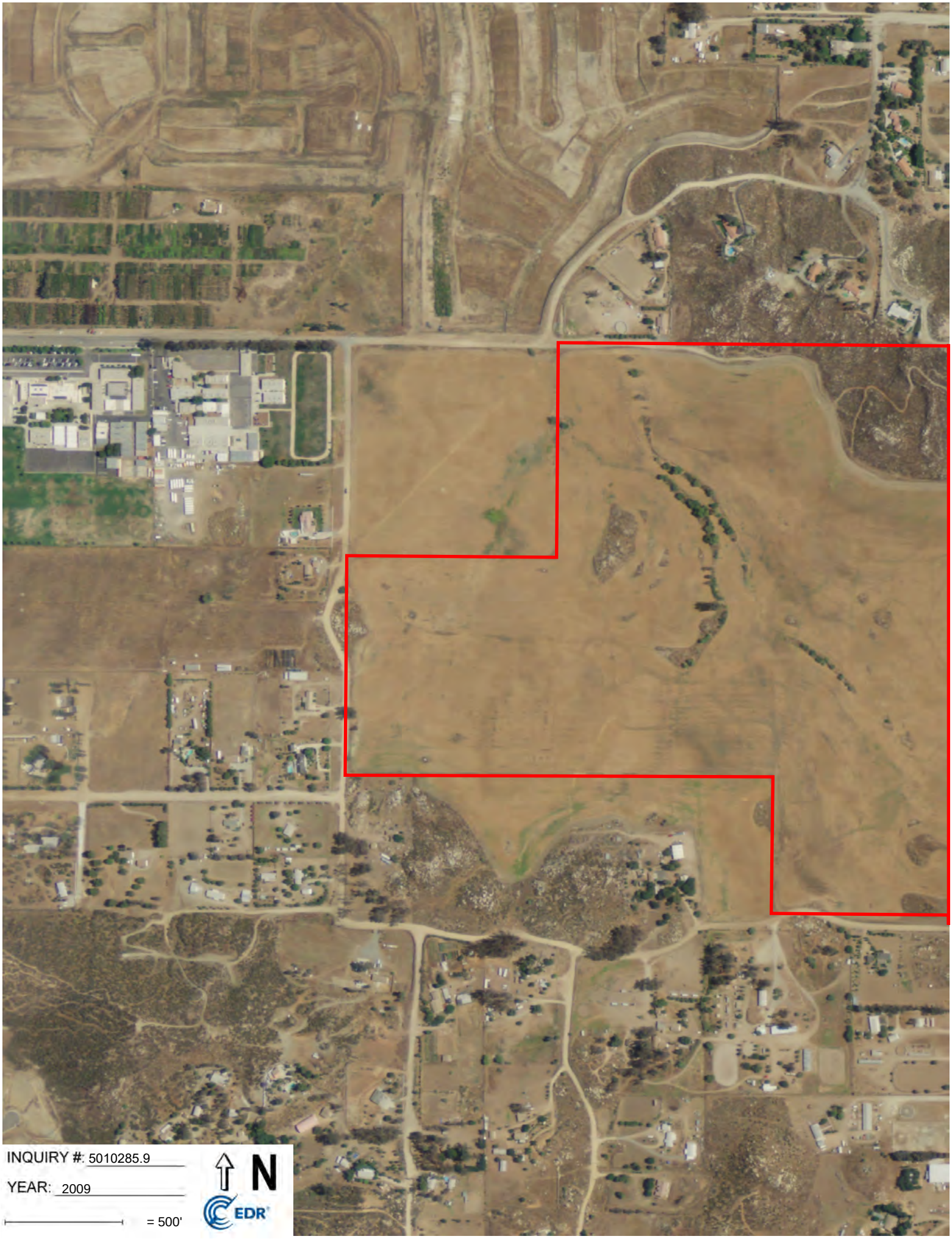
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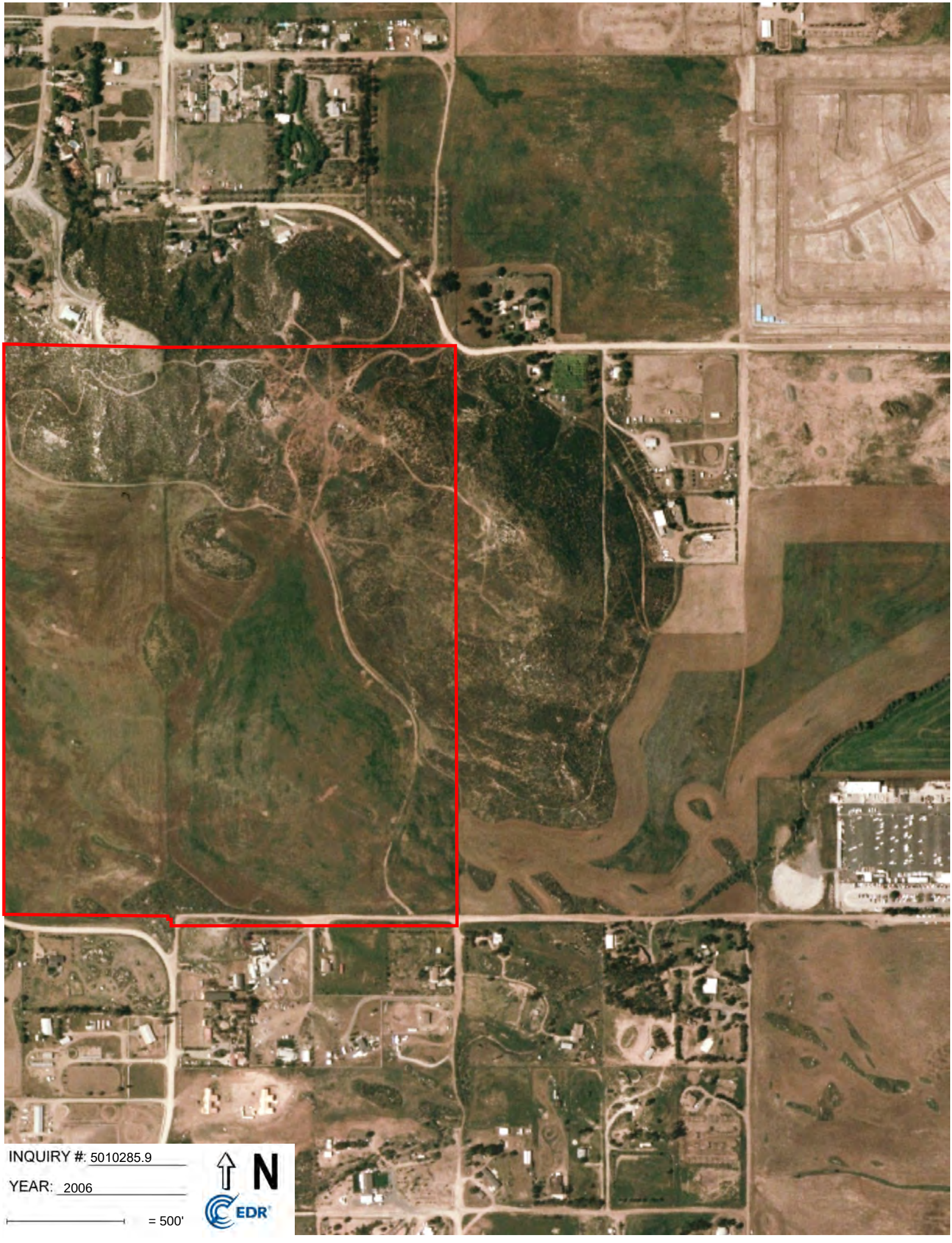
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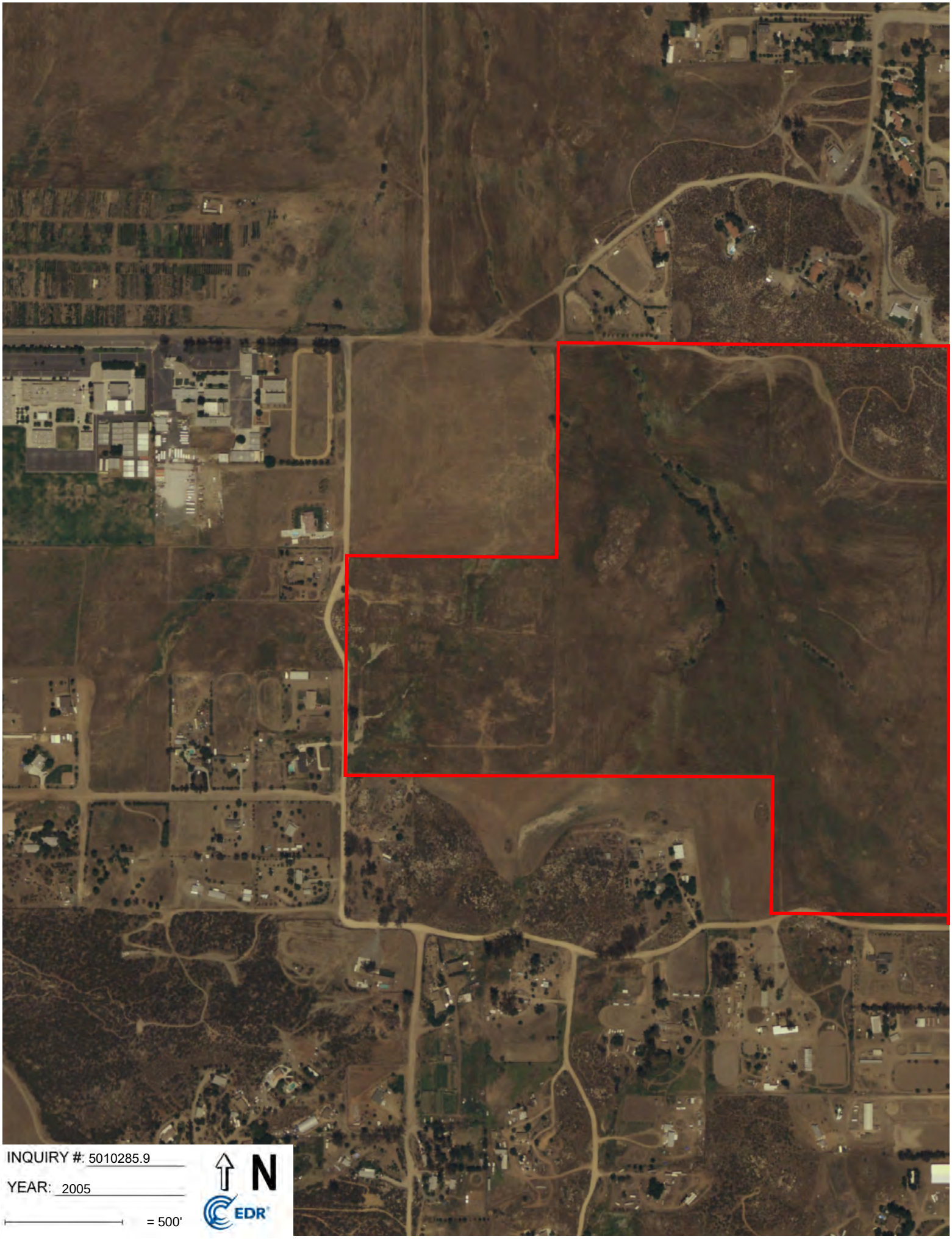
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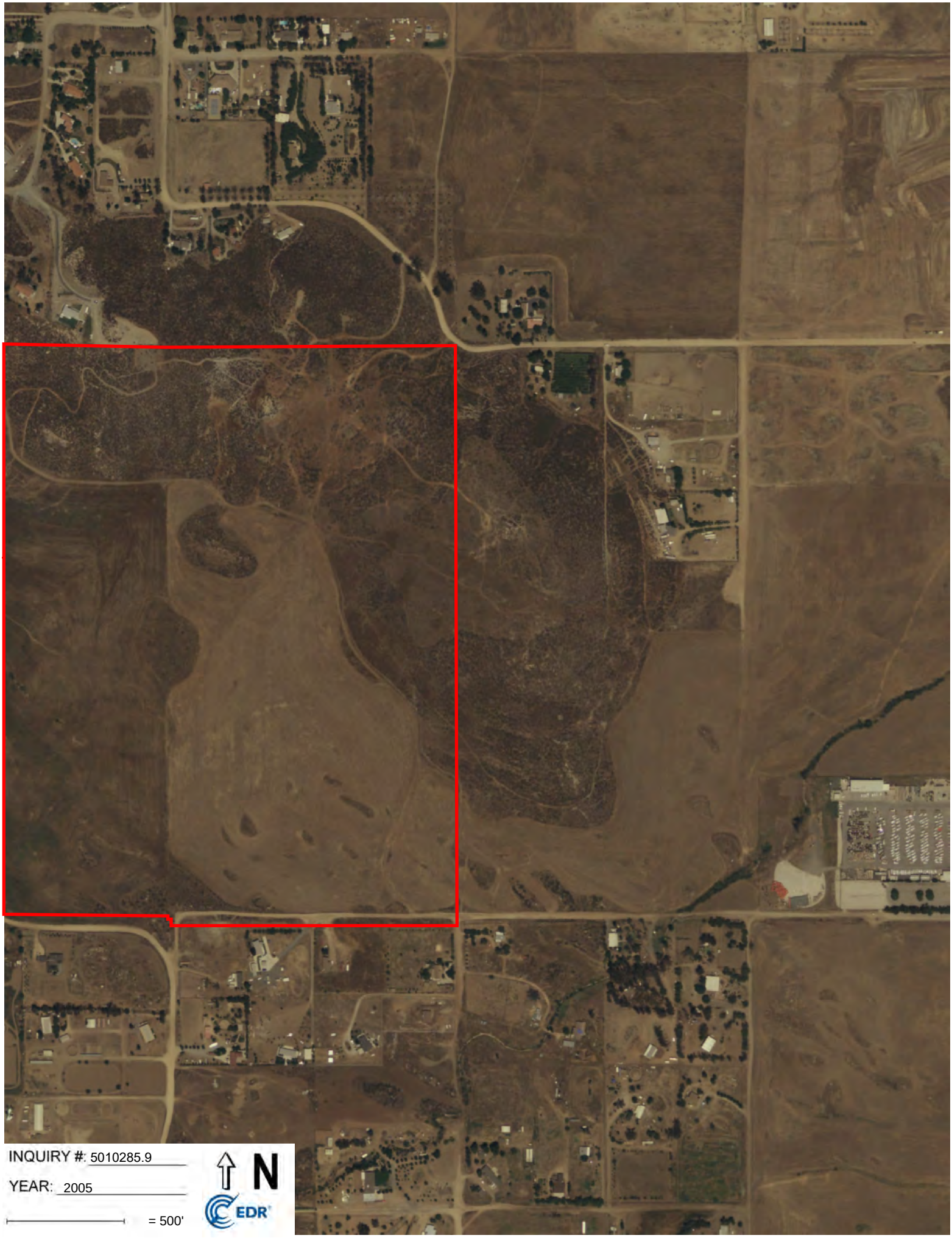
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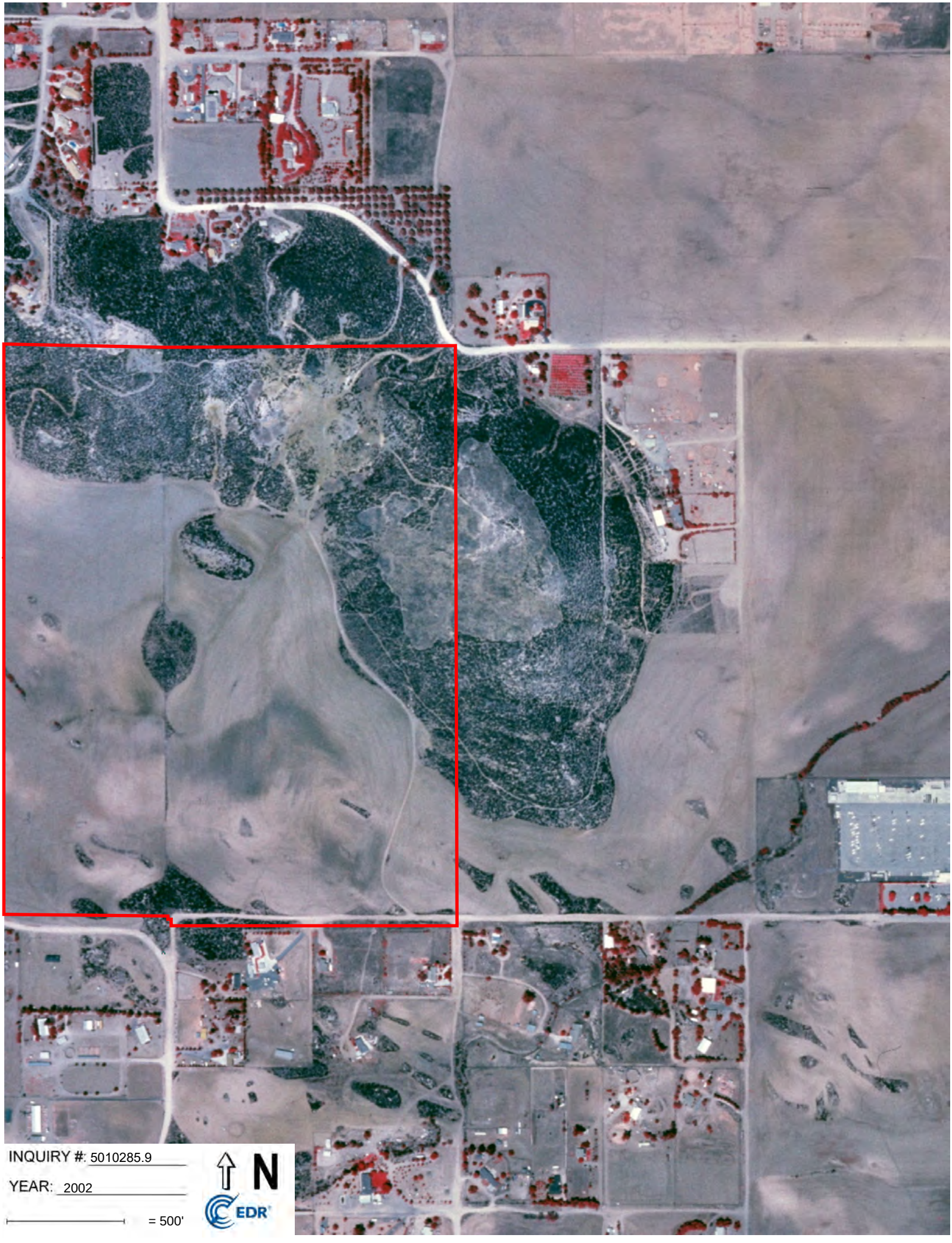
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YEAR: 1996

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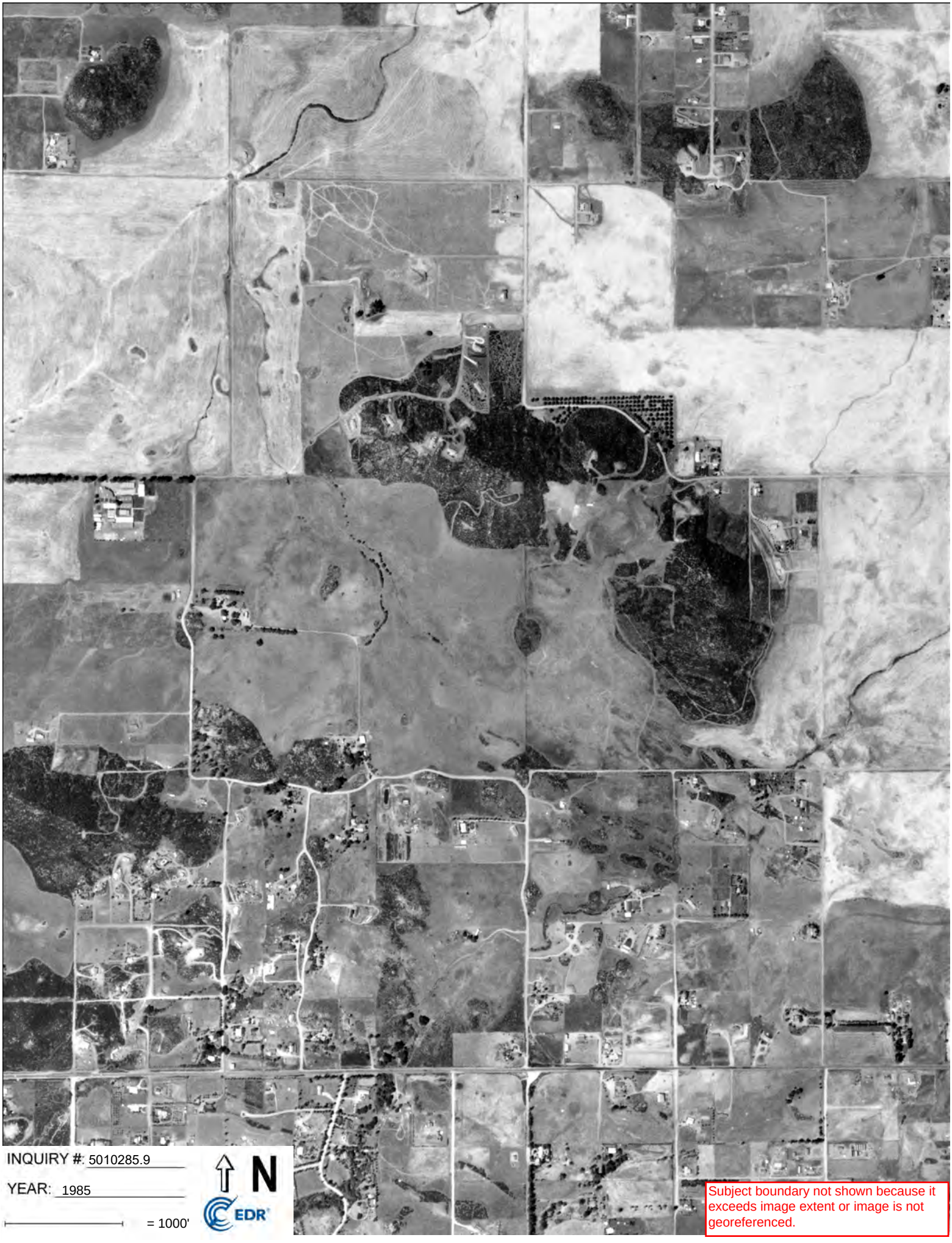
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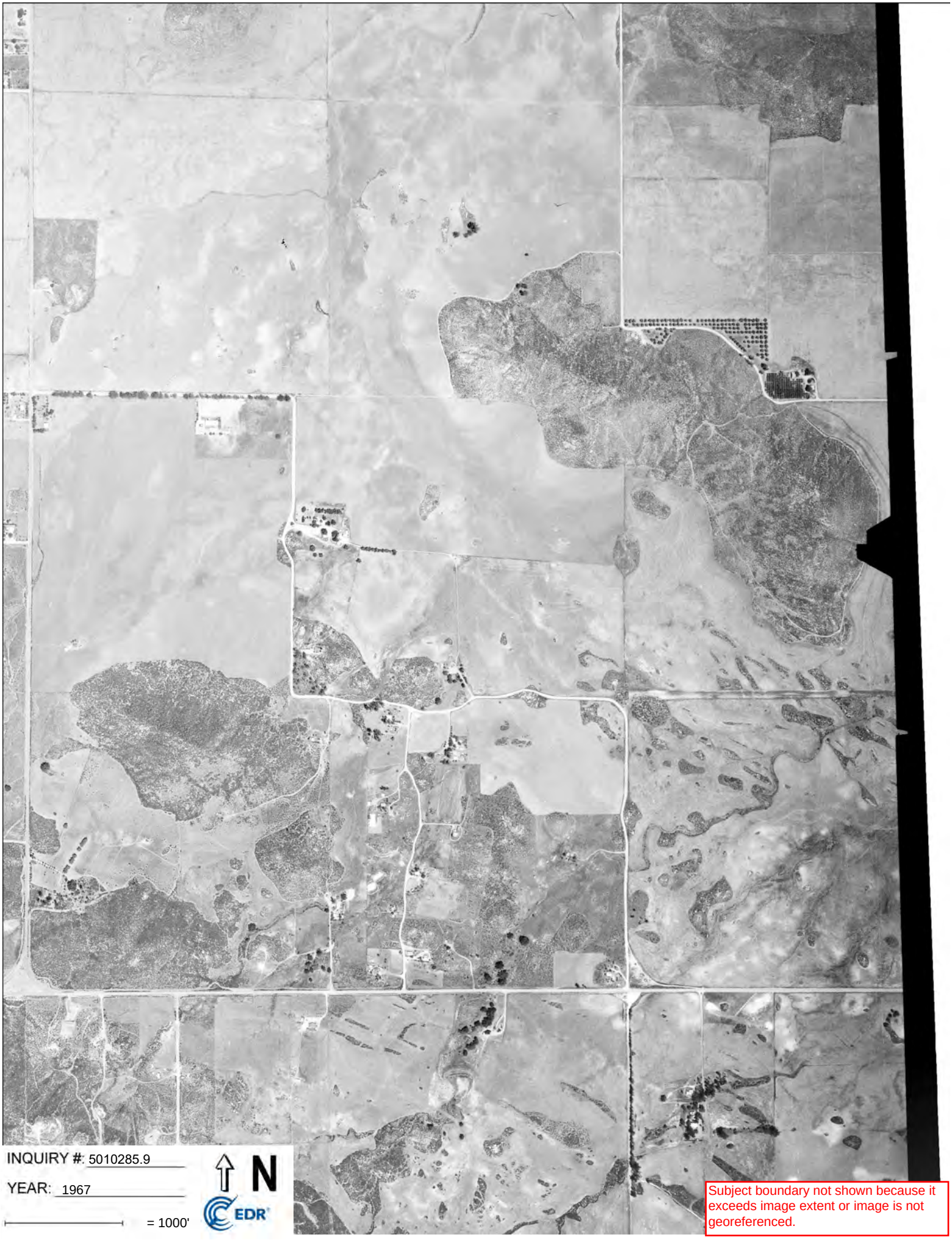

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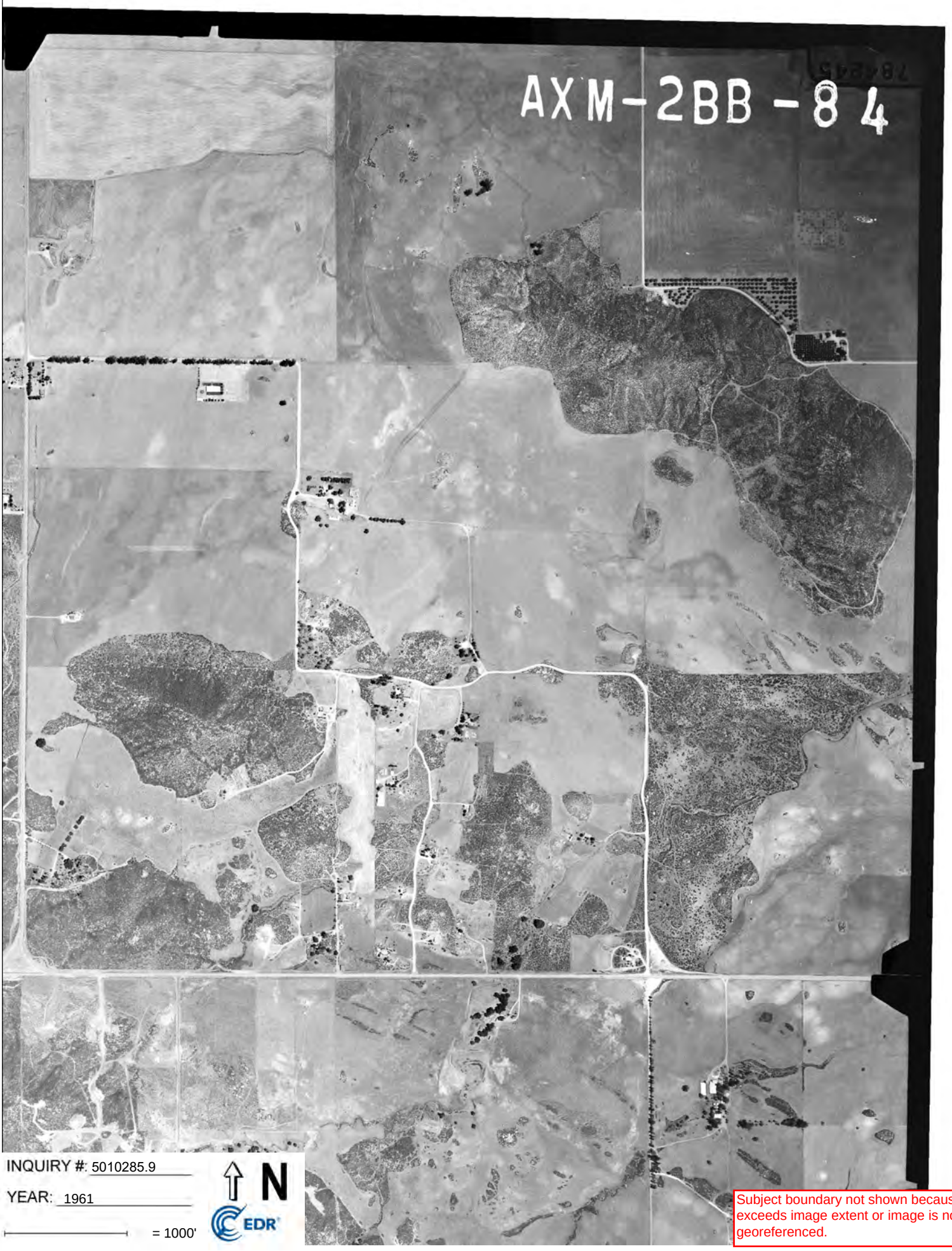

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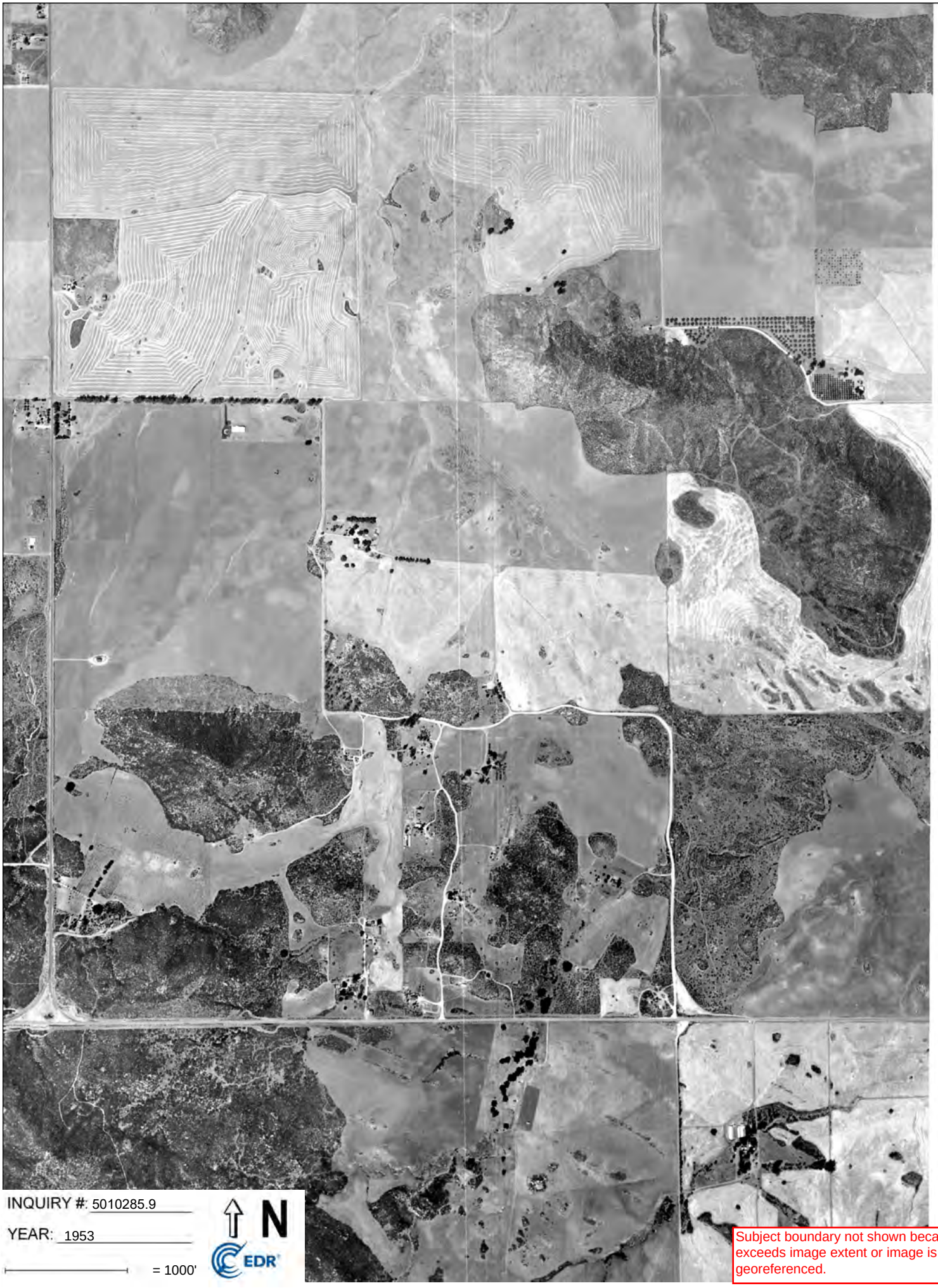

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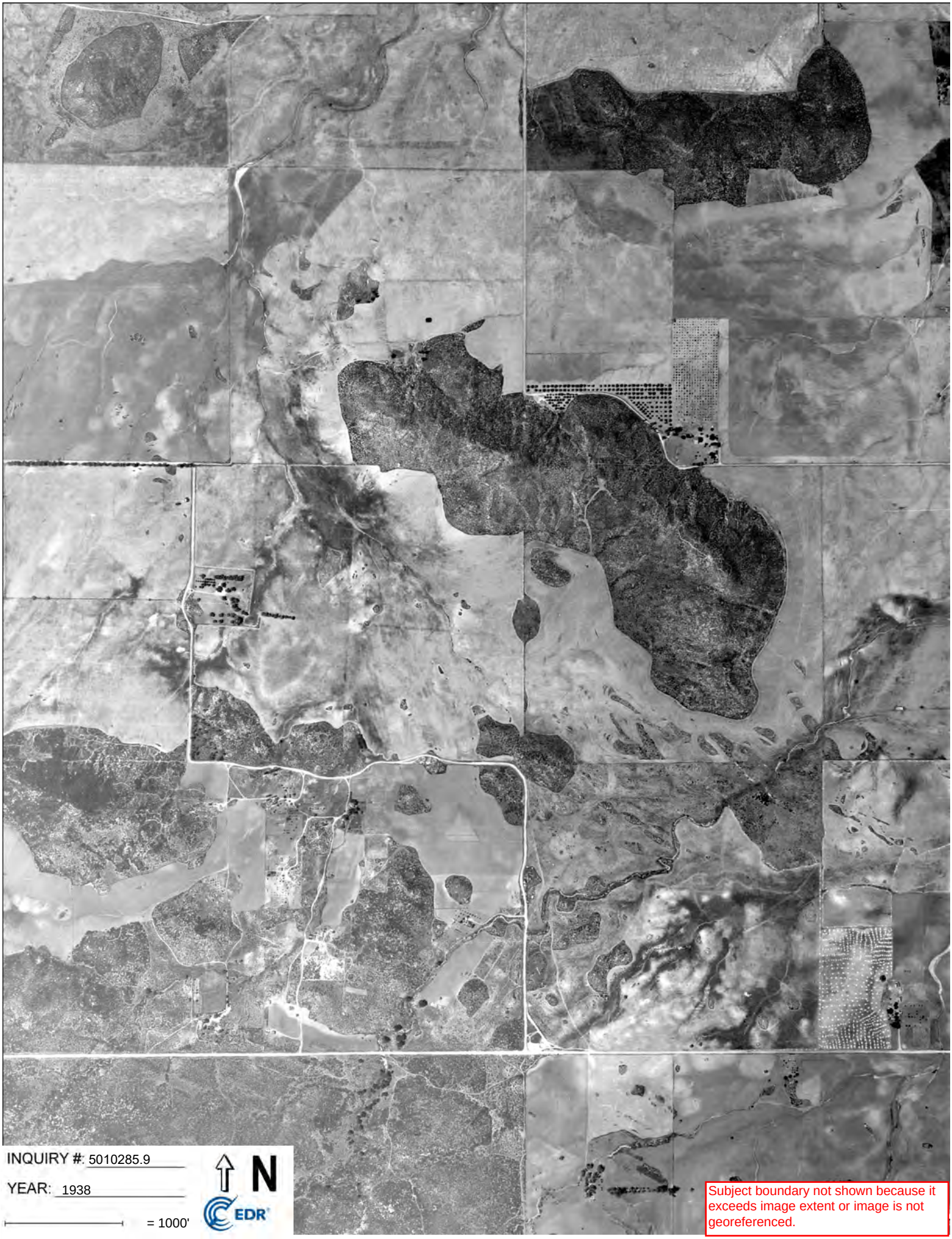

INQUIRY #: 5010285.9

YEAR: 1938

= 1000'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.

Wickerd Road

Wickerd Road

Menifee, CA 92584

Inquiry Number: 5010285.4

August 01, 2017

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

08/01/17

Site Name:	Client Name:
Wickerd Road	Hillmann Environmental Co.
Wickerd Road	1745 W Orangewood Avenue
Menifee, CA 92584	Orange, CA 92868-0000
EDR Inquiry # 5010285.4	Contact: Kristine Savona

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Search Results:		*Coordinates:*	
P.O.#	NA	**Latitude:**	33.651948 33° 39' 7" North
Project:	C3-6927	**Longitude:**	-117.193607 -117° 11' 37" West
		UTM Zone:	Zone 11 North
		UTM X Meters:	482048.21
		UTM Y Meters:	3723582.56
		Elevation:	1529.00' above sea level

Maps Provided:

2012
1979
1973
1953
1947
1943
1942
1901

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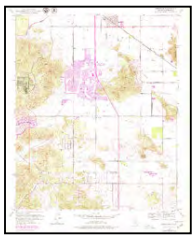
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

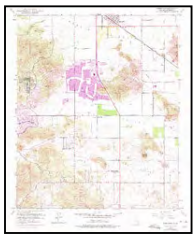
Romoland
2012
7.5-minute, 24000

1979 Source Sheets



Romoland
1979
7.5-minute, 24000
Aerial Photo Revised 1976

1973 Source Sheets



Romoland
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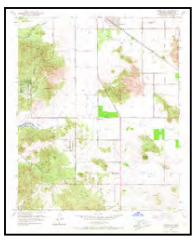
Aerial Photo Revised 1973

1953 Source Sheets



Romoland
1953
7.5-minute, 24000
Aerial Photo Revised 1951

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

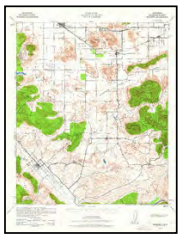
1947 Source Sheets

MURRIETA
1947
15-minute, 50000

1943 Source Sheets

Murrieta
1943
15-minute, 62500
Aerial Photo Revised 1939

1942 Source Sheets



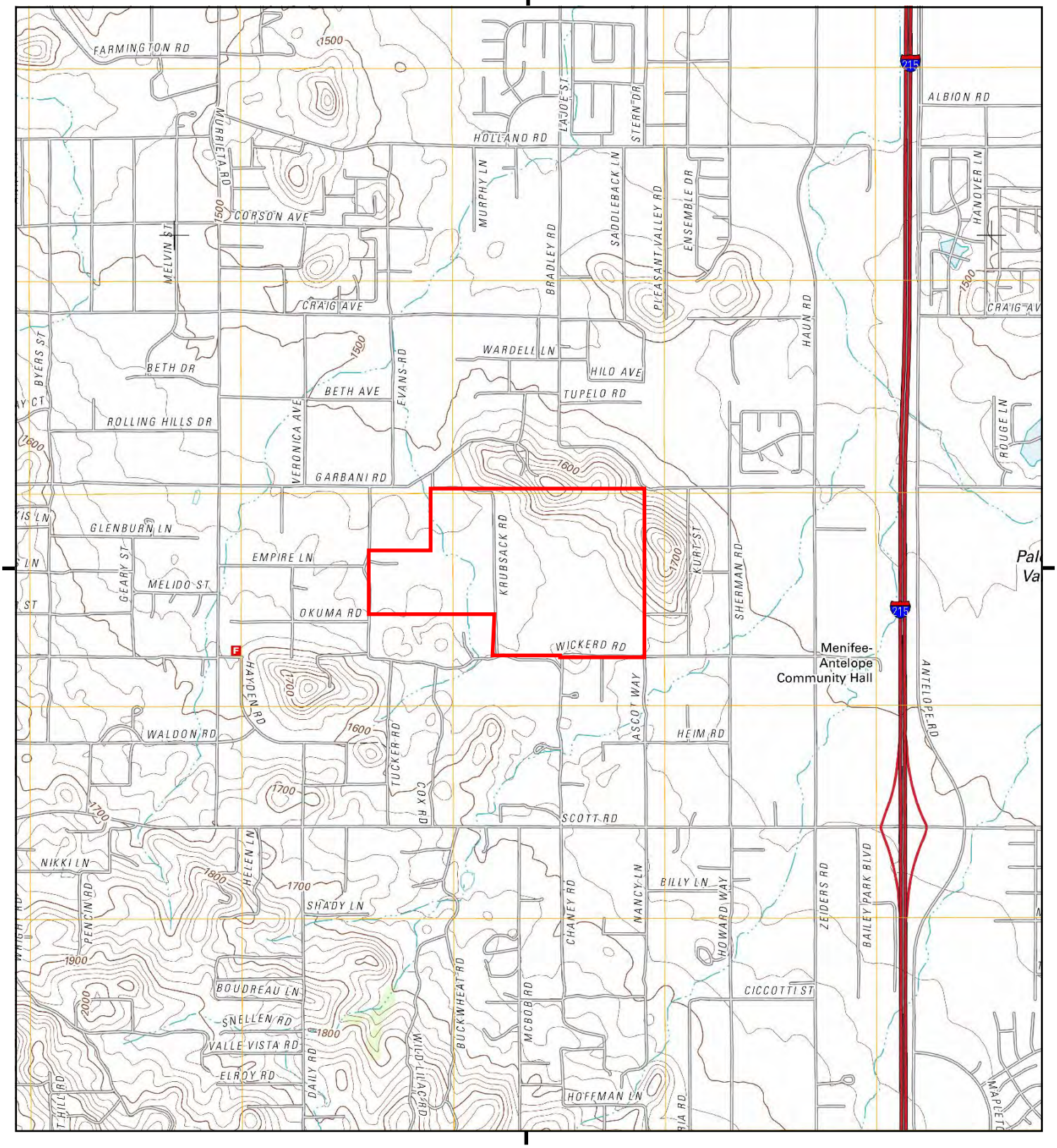
Murrieta
1942
15-minute, 62500
Aerial Photo Revised 1939

1901 Source Sheets

Elsinore
1901
30-minute, 125000

Historical Topo Map

2012



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

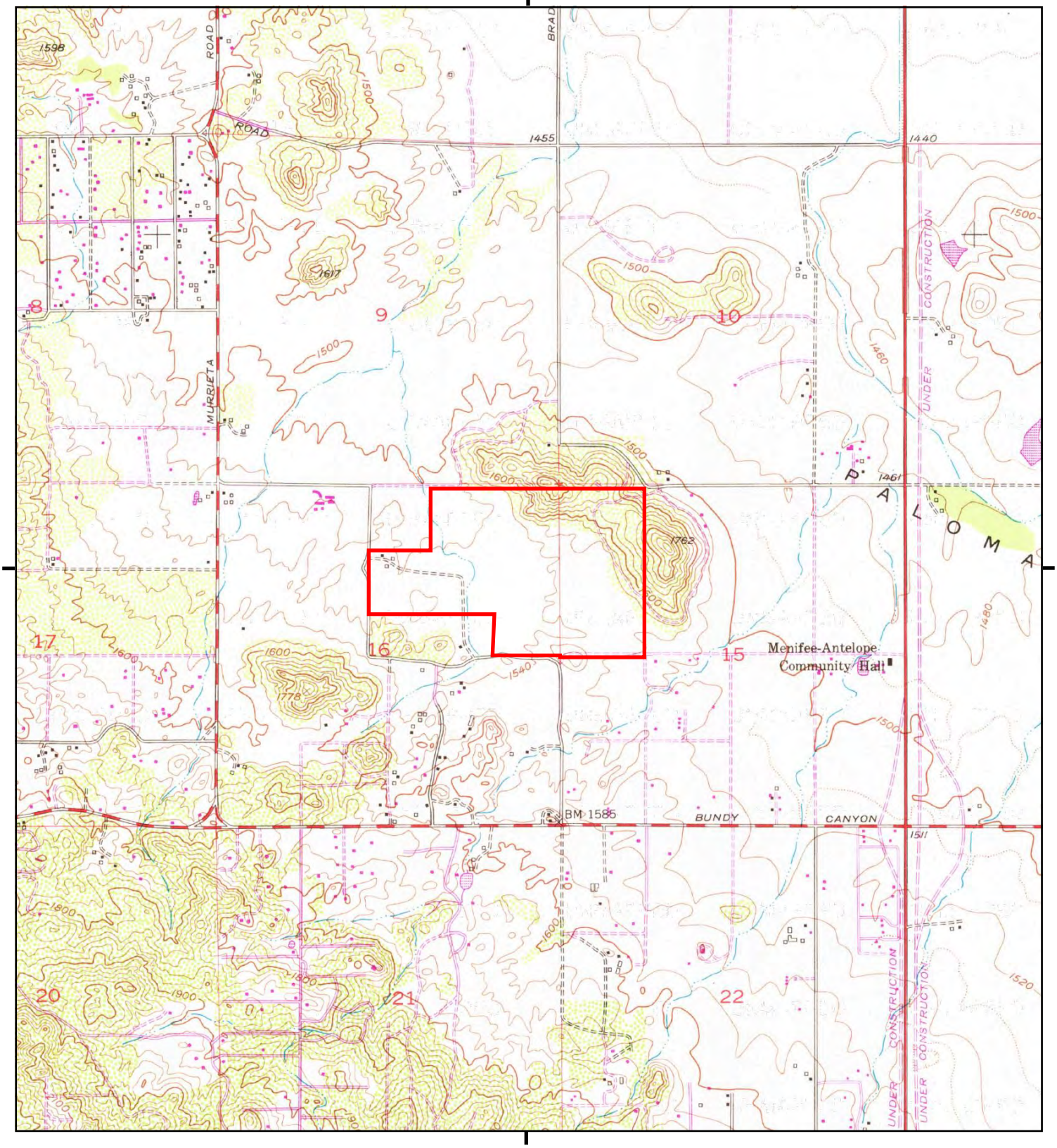
TP, Romoland, 2012, 7.5-minute

SITE NAME: Wickerd Road
ADDRESS: Wickerd Road
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1979



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0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

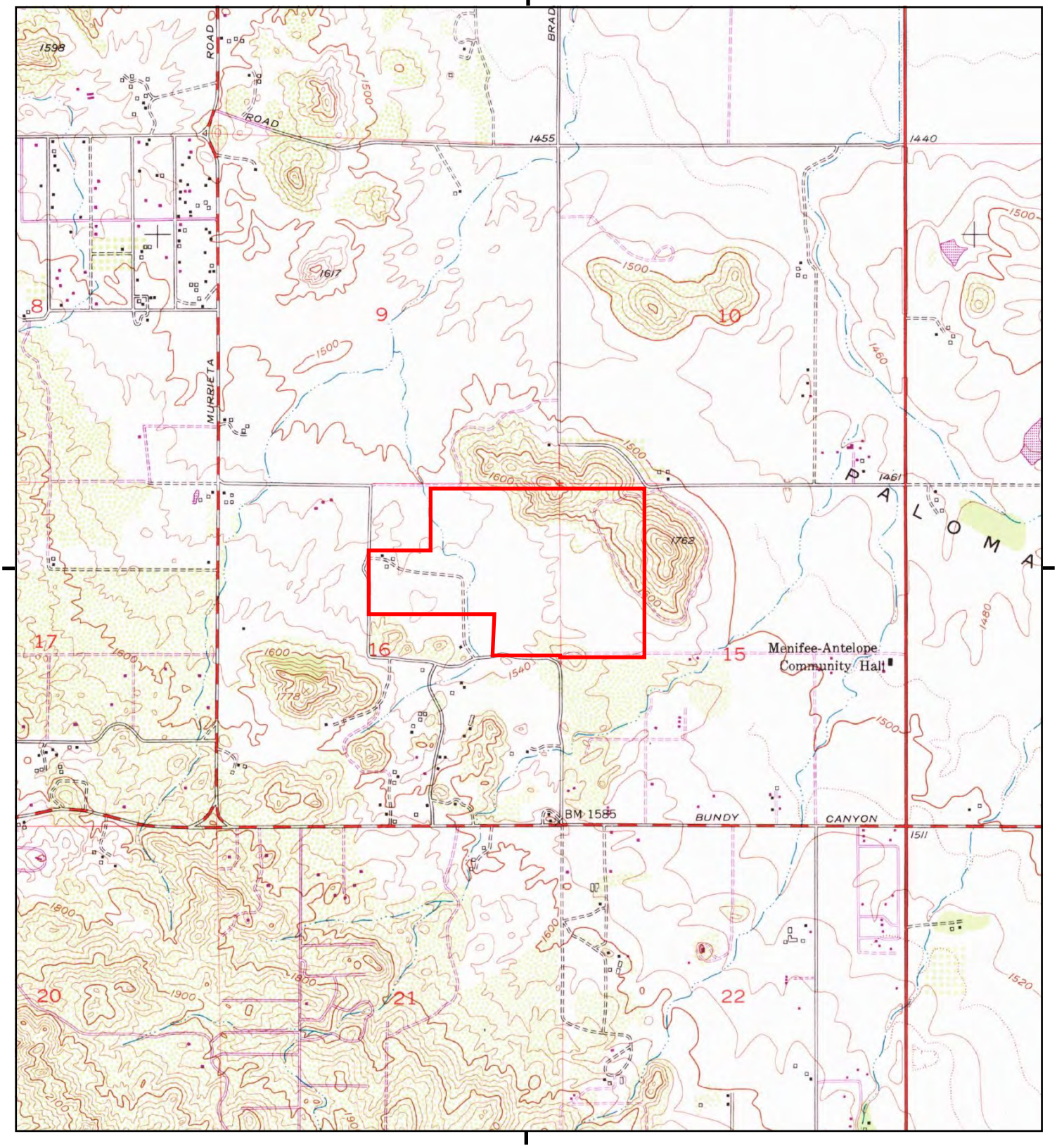
TP, Romoland, 1979, 7.5-minute

SITE NAME: Wickerd Road
ADDRESS: Wickerd Road
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1973



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

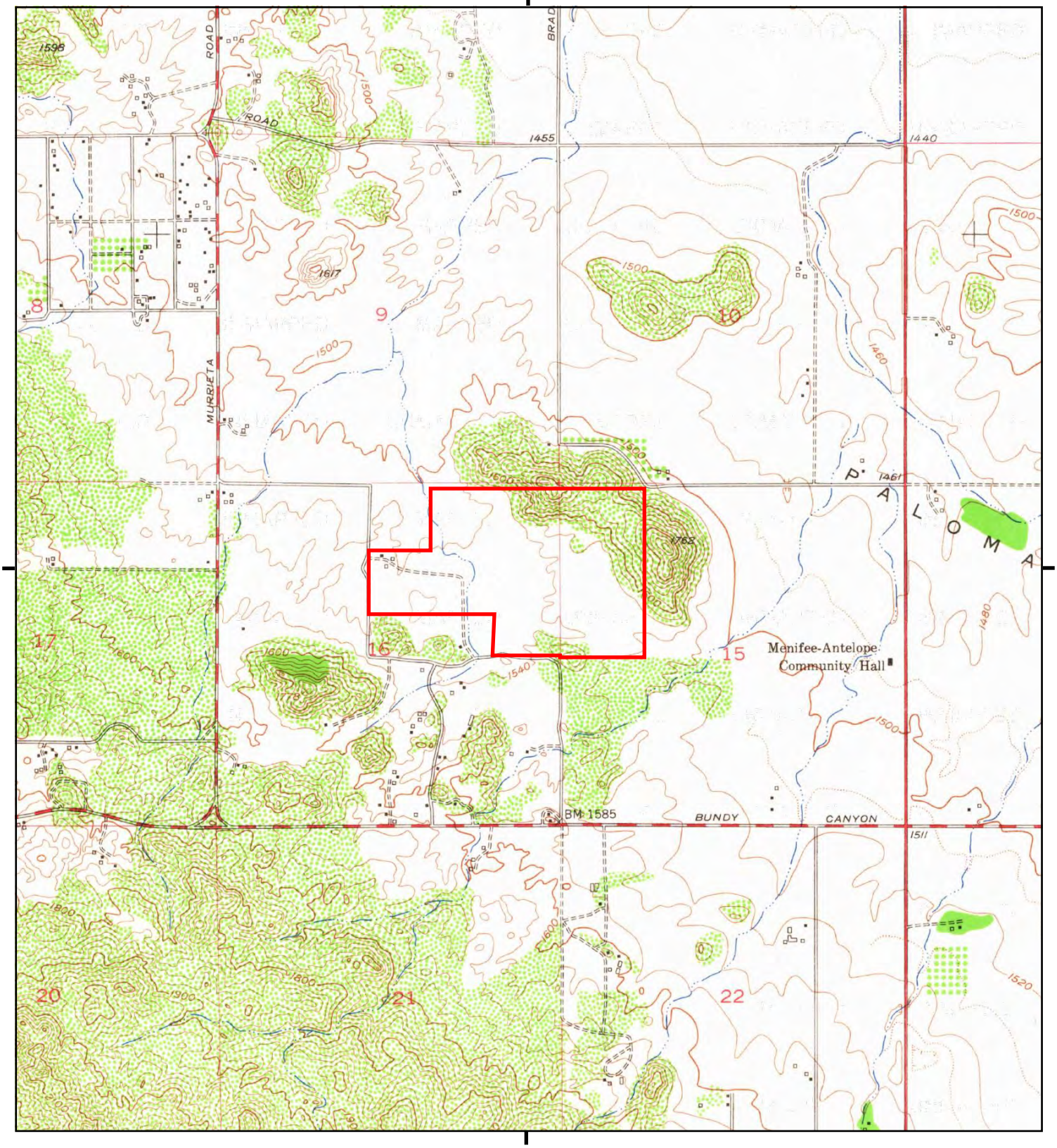
TP, Romoland, 1973, 7.5-minute

SITE NAME: Wickerd Road
ADDRESS: Wickerd Road
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1953



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

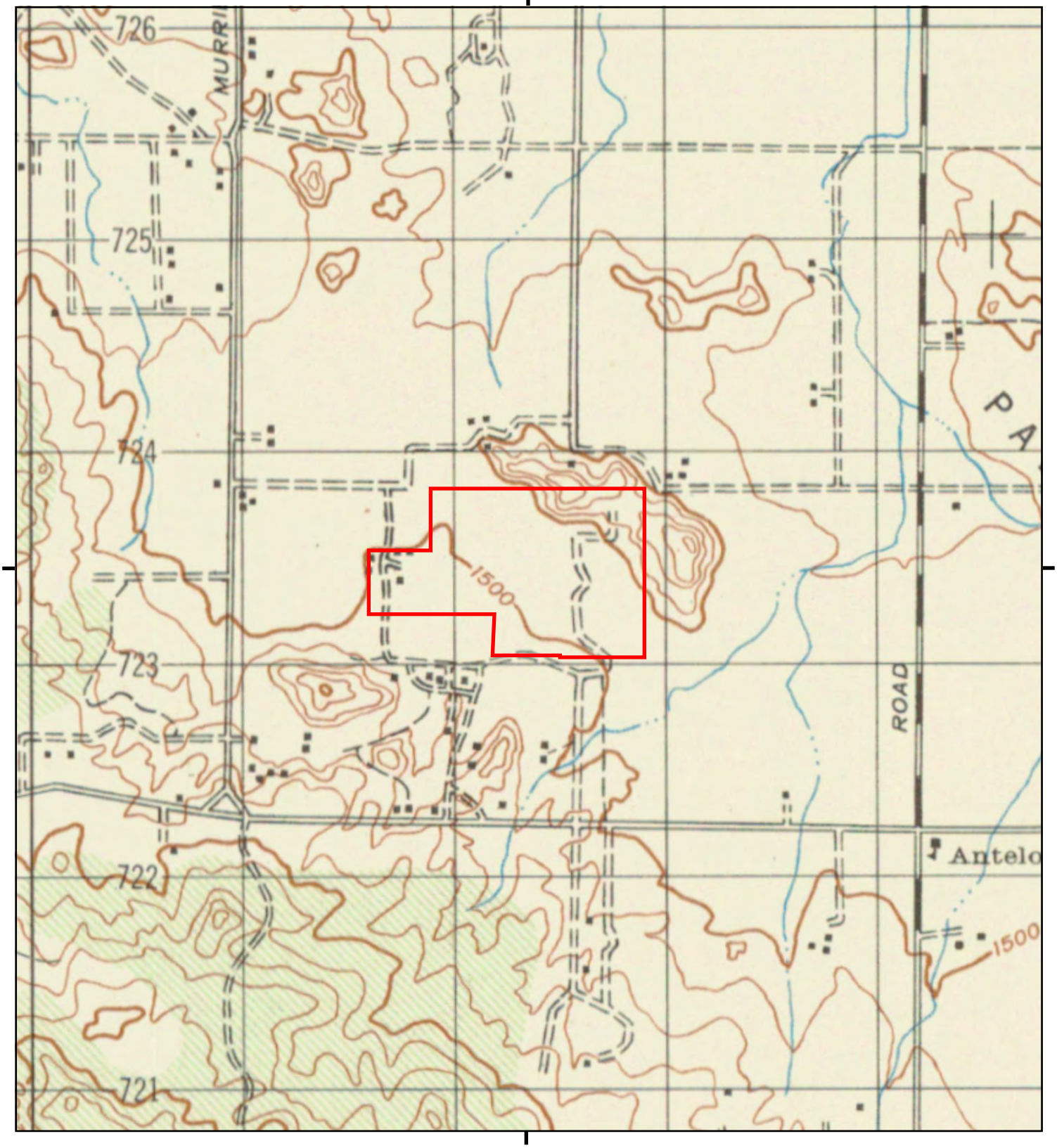
TP, Romoland, 1953, 7.5-minute

SITE NAME: Wickerd Road
ADDRESS: Wickerd Road
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1947



This report includes information from the following map sheet(s).

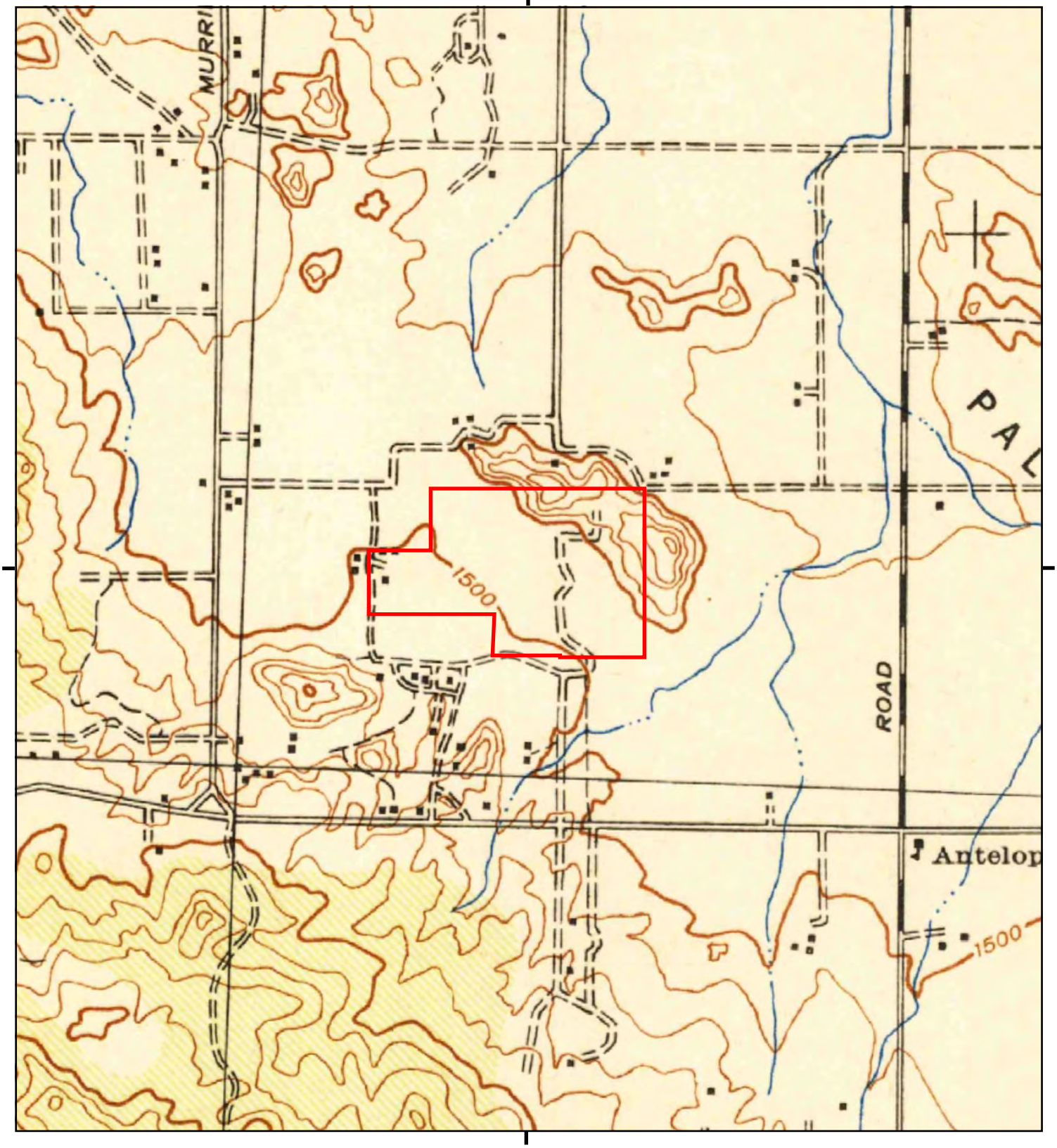
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, MURRIETA, 1947, 15-minute

SITE NAME: Wickerd Road
ADDRESS: Wickerd Road
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N



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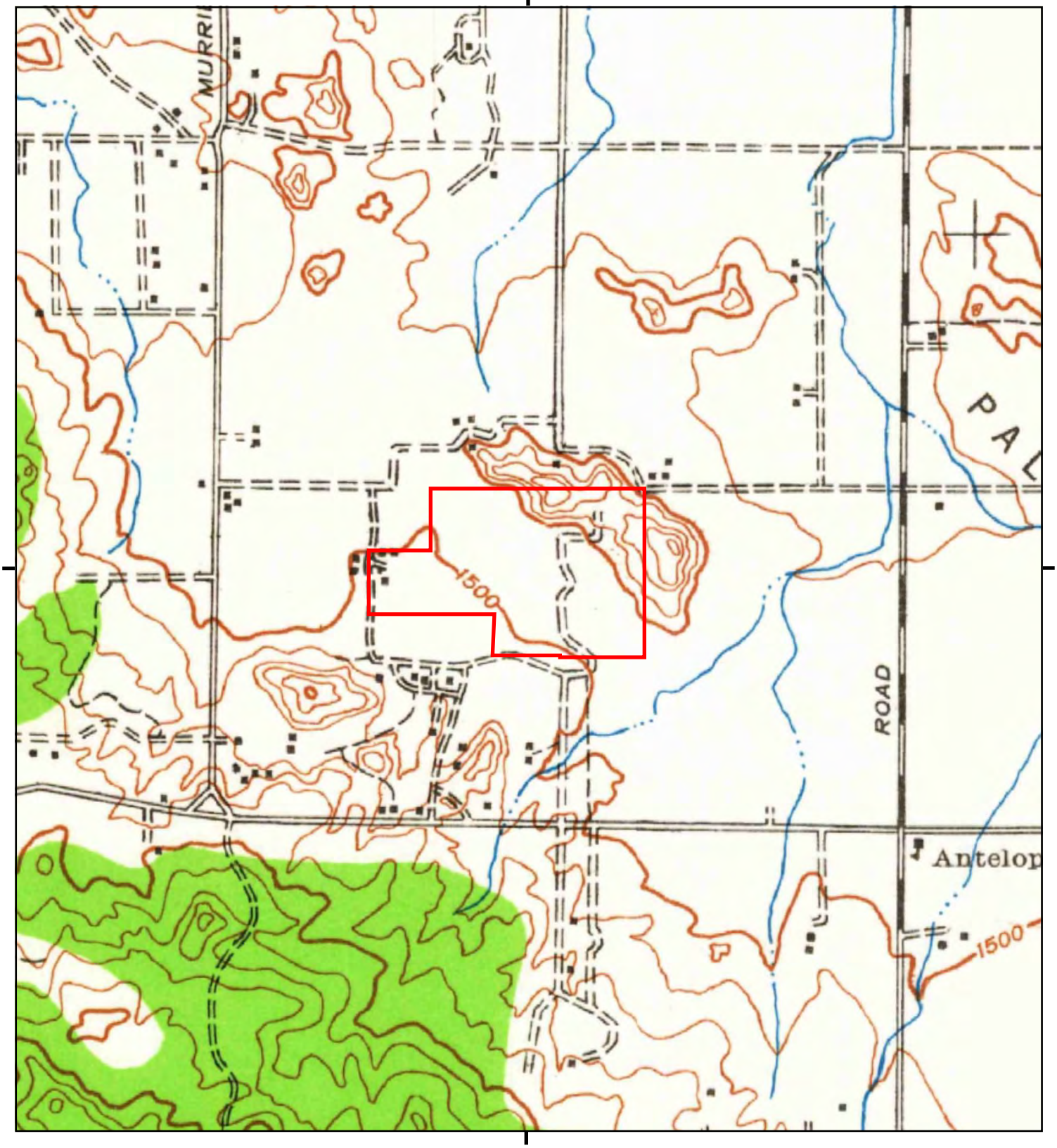
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Murrieta, 1943, 15-minute

SITE NAME: Wickerd Road
ADDRESS: Wickerd Road
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N



This report includes information from the following map sheet(s).

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NW N NE
W E
SW S SE

TP, Murrieta, 1942, 15-minute

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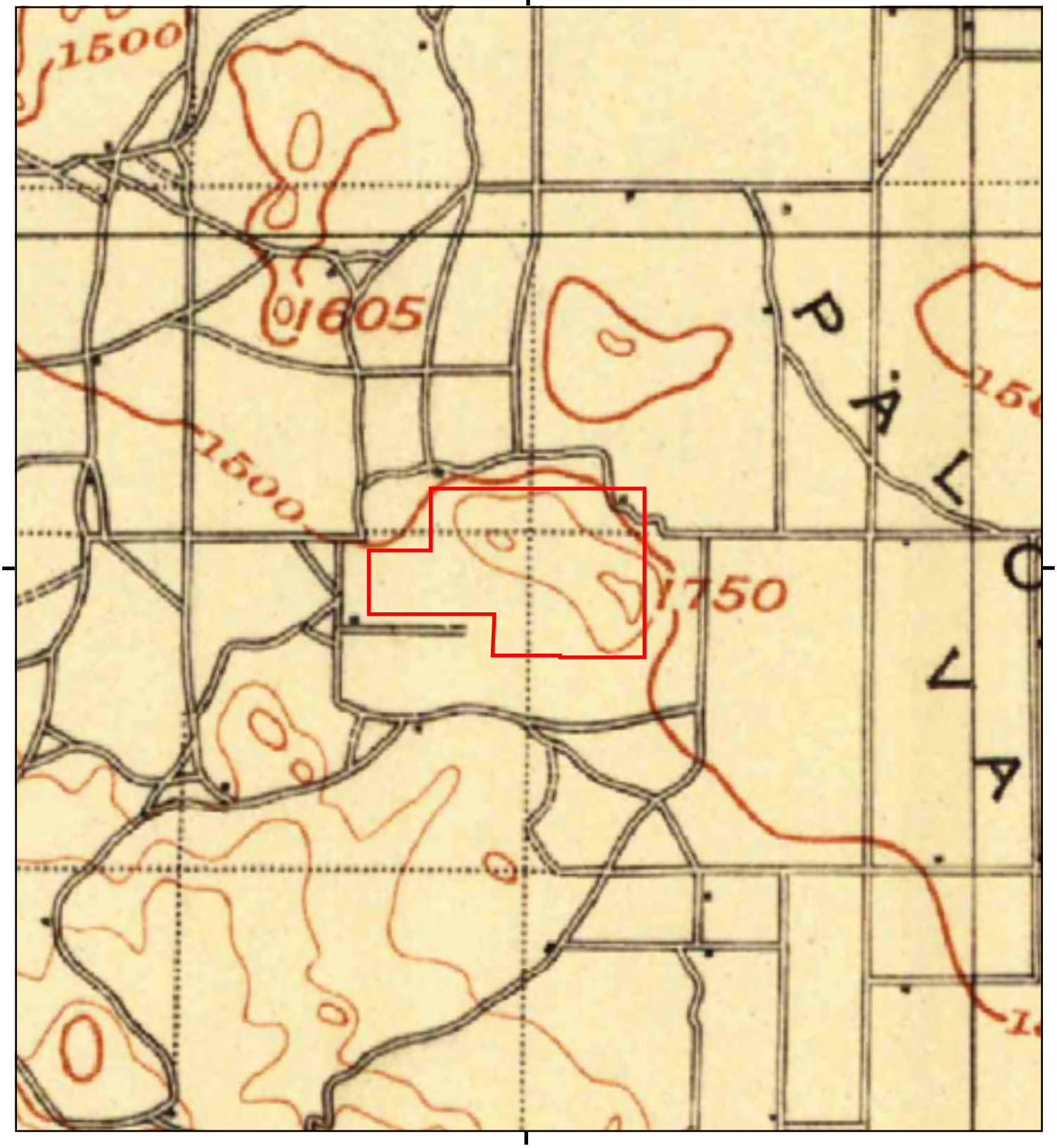
ADDRESS: Wickerd Road
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N



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0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Elsinore, 1901, 30-minute

SITE NAME: Wickerd Road
ADDRESS: Wickerd Road
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Wickerd Road

Wickerd Road

Menifee, CA 92584

Inquiry Number: 5010285.3

August 01, 2017

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

08/01/17

Site Name:	Client Name:
Wickerd Road	Hillmann Environmental Co.
Wickerd Road	1745 W Orangewood Avenue
Menifee, CA 92584	Orange, CA 92868-0000
EDR Inquiry # 5010285.3	Contact: Kristine Savona

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Certified Sanborn Results:

Certification # 6D60-4617-A527

PO # NA

Project C3-6927

UNMAPPED PROPERTY

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Sanborn® Library search results

Certification #: 6D60-4617-A527

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- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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Wickerd Road
Wickerd Road
Menifee, CA 92584

Inquiry Number: 5010285.11
August 14, 2017

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Executive Summary

Findings

City Directory Images

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2013	☑	☑	Cole Information Services
2008	☑	☑	Cole Information Services
2003	☑	☑	Cole Information Services
1999	☑	☑	Cole Information Services
1995	☑	☑	Cole Information Services
1992	☑	☐	Cole Information Services
1990	☑	☑	Haines Criss-Cross Directory
1985	☑	☑	Haines Criss-Cross Directory
1980	☑	☑	Haines Criss-Cross Directory
1975	☑	☑	Haines Criss-Cross Directory

RECORD SOURCES

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FINDINGS

TARGET PROPERTY STREET

Wickerd Road
Menifee, CA 92584

Year	*CD Image*	*Source*
WICKERD RD		
2013	pg A2	Cole Information Services
2008	pg A4	Cole Information Services
2003	pg A6	Cole Information Services
1999	pg A8	Cole Information Services
1995	pg A10	Cole Information Services
1992	pg A11	Cole Information Services
1990	pg A13	Haines Criss-Cross Directory
1985	pg A15	Haines Criss-Cross Directory
1980	pg A17	Haines Criss-Cross Directory
1975	pg A19	Haines Criss-Cross Directory

FINDINGS

CROSS STREETS

Year	*CD Image*	*Source*	
EVANS RD			
2013	pg. A1	Cole Information Services	
2008	pg. A3	Cole Information Services	
2003	pg. A5	Cole Information Services	
1999	pg. A7	Cole Information Services	
1995	pg. A9	Cole Information Services	
1992	-	Cole Information Services	Target and Adjoining not listed in Source
1990	pg. A12	Haines Criss-Cross Directory	
1985	pg. A14	Haines Criss-Cross Directory	
1980	pg. A16	Haines Criss-Cross Directory	
1975	pg. A18	Haines Criss-Cross Directory	

City Directory Images

Target Street	Cross Street	Source
-	✓	Cole Information Services

EVANS RD 2013

30465	CHILD DEVELOPMENT CENTERS
	MENIFEE UNION SCHOOL DISTRICT
31270	STEVE BOSHARD
32201	ANGEL RODRIGUEZ
32233	FRED JAMES
32276	OCCUPANT UNKNOWN
32345	COLT SANDERSON
32355	RYE HEFLEY
32420	OCCUPANT UNKNOWN
32425	OCCUPANT UNKNOWN
32485	P KIRKPATRICK

Target Street	Cross Street	Source
✓	-	Cole Information Services

WICKERD RD 2013

25560	OCCUPANT UNKNOWN
25605	OCCUPANT UNKNOWN
25611	CHARLOTTE SHIFFLET
25620	GERALD KEELEY
25625	RICHARD TROTTER
25925	OCCUPANT UNKNOWN
26020	COUNTY OF RIVERSIDE
26031	DONNA KING
26048	JIM FOLEY
	JIM FOLEY TRUCKING
26200	OCCUPANT UNKNOWN
26410	AA LYNCO INC
	OCCUPANT UNKNOWN
26501	LESLIE MACHADO
26789	CHRISTA SCHAFFER
27131	PAUL FIGGINS
27145	EDDIE SPETE
27171	JAIME AVILA
27269	CATHRINE LEONE
27379	OCCUPANT UNKNOWN
27895	SOIL AYALA
27985	SO CAL MULCH INC
28900	RICHARD MAHONEY
29001	BART VERSTEGEN
29175	ANTONIUS VERSTEGEN
29300	OCCUPANT UNKNOWN
29612	CHARLES MILLER
	EZ WAY CONCRETE PUMPING
30125	PACIFIC STATES ENGINEERING
32715	OCCUPANT UNKNOWN
33680	DEREK SHEVITSKI

Target Street	Cross Street	Source
-	✓	Cole Information Services

EVANS RD 2008

31270	STEVE BOSHARD
32201	ANGEL RODRIGUEZ
32233	FRED JAMES
	JAMES ENTERPRISES
32276	OCCUPANT UNKNOWN
32345	THOMAS SANDERSON
32355	RYE HEFLEY
32420	OCCUPANT UNKNOWN
32425	JOSE MEDINA
32485	ANNAMARIE SMITH
	KIRKPATRICK HANDYMAN SERVICE

Target Street	Cross Street	Source
✓	-	Cole Information Services

WICKERD RD 2008

25560	DONALD VANDYKE
25605	ALBERTO NACIF
25620	GERALD KEELEY
25625	RICHARD TROTTER
	RODNEY SLONECKER
25925	ANGEL MALDONADO
26020	RIVERSIDE COUNTY FIRE DEPT
26031	OCCUPANT UNKNOWN
26048	JIM FOLEY
	JIM FOLEY TRUCKING
26185	OCCUPANT UNKNOWN
26200	KATHRYN KRUBSACK
26410	THAMES AUGUST
26501	MACHADO FARMS
	RICK MACHADO
26789	JAMES SCHAFFER
	WAGON WHEEL RANCH
27131	PAUL FIGGINS
27145	EDDIE SPETZ
27171	JAIME AVILA
27269	GLORIA CARLOS
27379	DONALD GRAVETT
27895	SOIL AYALA
27985	AYALA SOIL BLENDS
	LOUIES NURSERY INC
	PRECISION SOILS & FOREST PRODUCTS
28900	ARMANDO CENDEJAS
29001	BART VERSTEGEN
29175	ANTONIUS VERSTEGEN
29300	SHUCHUNG HSIAO
29612	CHARLES MILLER
	E Z WAY CONCRETE PUMPING
30125	KEVIN ELLIS
33680	DEREK SHEVITSKI

Target Street	Cross Street	Source
-	✓	Cole Information Services

EVANS RD 2003

31315 TYE DAVIS
32233 FRED JAMES
JAMES ENTERPRISES
32276 DANNY MATTHEW
32345 THOMAS SANDERSON
32355 RYE HEFLEY
32425 JAMES RUSSELL
32485 JAMES KIRKPATRICK
32840 CHERI WILLIAMS

Target Street	Cross Street	Source
✓	-	Cole Information Services

WICKERD RD 2003

25560	PHILLIP COOMBS
25605	ALBERTO NACIF
25611	TERRY SHIFFLET
25620	GERALD KEELEY
25625	JACK PIERCE
	RICHARD TROTTER
	RODNEY SLONECKER
25925	ANGEL MALDONADO
26020	RIVERSIDE COUNTY OF FIRE DEPT
26031	TRACY SANDERS
26185	WILLIAM MCNAIR
26200	KATHRYN KRUBSACK
26410	THAMES AUGUST
26740	DENNIS COWAN
26789	OCCUPANT UNKNOWN
	WAGON WHEEL RANCH
27131	MARY BENDA
27145	CHRIS ALCARAZ
27171	THE PLANT PEOPLE
27269	CARLOS GLORIA
	GLORIA CARLOS
27895	AYALA SOIL BLENDS
	SOIL AYALA
27985	DAVID DELATORRE
28900	CYNTHIA PRANO
29001	OCCUPANT UNKNOWN
29175	OCCUPANT UNKNOWN
29300	SHUCHUNG HSIAO
29612	CHARLES MILLER
30125	JAY CATHRO
33640	OCCUPANT UNKNOWN
33660	OCCUPANT UNKNOWN
33680	DEREK SHEVITSKI

Target Street	Cross Street	Source
-	✓	Cole Information Services

EVANS RD 1999

31270	STEVE BOSHARD
32201	ANGEL RODRIGUEZ
32233	FRED JAMES
32345	THOMAS SANDERSON
32355	RYE HEFLEY
32420	BILLY VANCE
32425	JOSE MEDINA
32485	TIMOTHY KIRKPATRICK

Target Street	Cross Street	Source
✓	-	Cole Information Services

WICKERD RD 1999

25605 ALBERTO NACIF
25620 GERALD KEELEY
25625 RICHARD TROTTER
RODNEY SLONECKER
26020 RIVERSIDE COUNTY OF FIRE DEPARTMENT
26048 JIM FOLEY
26200 ROBERT KRUBSACK
26410 THAMES AUGUST
26789 JAMES SCHAFFER
27131 PAUL FIGGINS
27171 JAIME AVILA
27269 GLORIA CARLOS
27895 AYALA SOIL BLENDS
SOIL AYALA
27985 QUALITY SHEDS
28900 ARMANDO CENDEJAS
29001 BART VERSTEGEN
29175 ANTONIUS VERSTEGEN
29300 SHUCHUNG HSIAO
29612 CHARLES MILLER
33680 DEREK SHEVITSKI

Target Street	Cross Street	Source
-	✓	Cole Information Services

EVANS RD 1995

32485 OCCUPANT UNKNOWNN

Target Street	Cross Street	Source
✓	-	Cole Information Services

WICKERD RD 1995

25625	PIERCE, JACK A
25925	EGBERT, ROBERT
26200	KRUBSACK, LOUIS E
26501	MACHADO, RICHARD
27145	SPETZ, EDDIE
27985	AVILA, ALFONSO
	QUALITY SHEDS
28900	HUEGEL, FAITH
29001	VERSTEGEN, BART
29175	VERSTEGEN, A H
29300	HSIAO, SHU C
29612	MILLER, CHUCK
30125	CATHRO, JAY
33680	SHEVITSKI, DEREK

Target Street	Cross Street	Source
✓	-	Cole Information Services

WICKERD RD 1992

25611	SHIFFLET, TERRY
25925	EGBERT, ROBERT
26185	VOGSTROM, DICK
27895	AYALA SOIL BENDS
27985	QUALITY SHEDS
28900	HUEGEL, FAITH
29001	VERSTEGEN, BART
30125	FCATHRO, JAY

Target Street	Cross Street	Source
-	✓	Haines Criss-Cross Directory

EVANS RD 1990

EVANS RD 92380
ROMOLAND

MENIFEE AREA

RURAL ROUTE 1

32233	JAMES Fred	679-8771	5
32276	XXXX	00	
★	0 BUS 2 RES	0 NEW	

EVANS RD 92381
SUN CITY

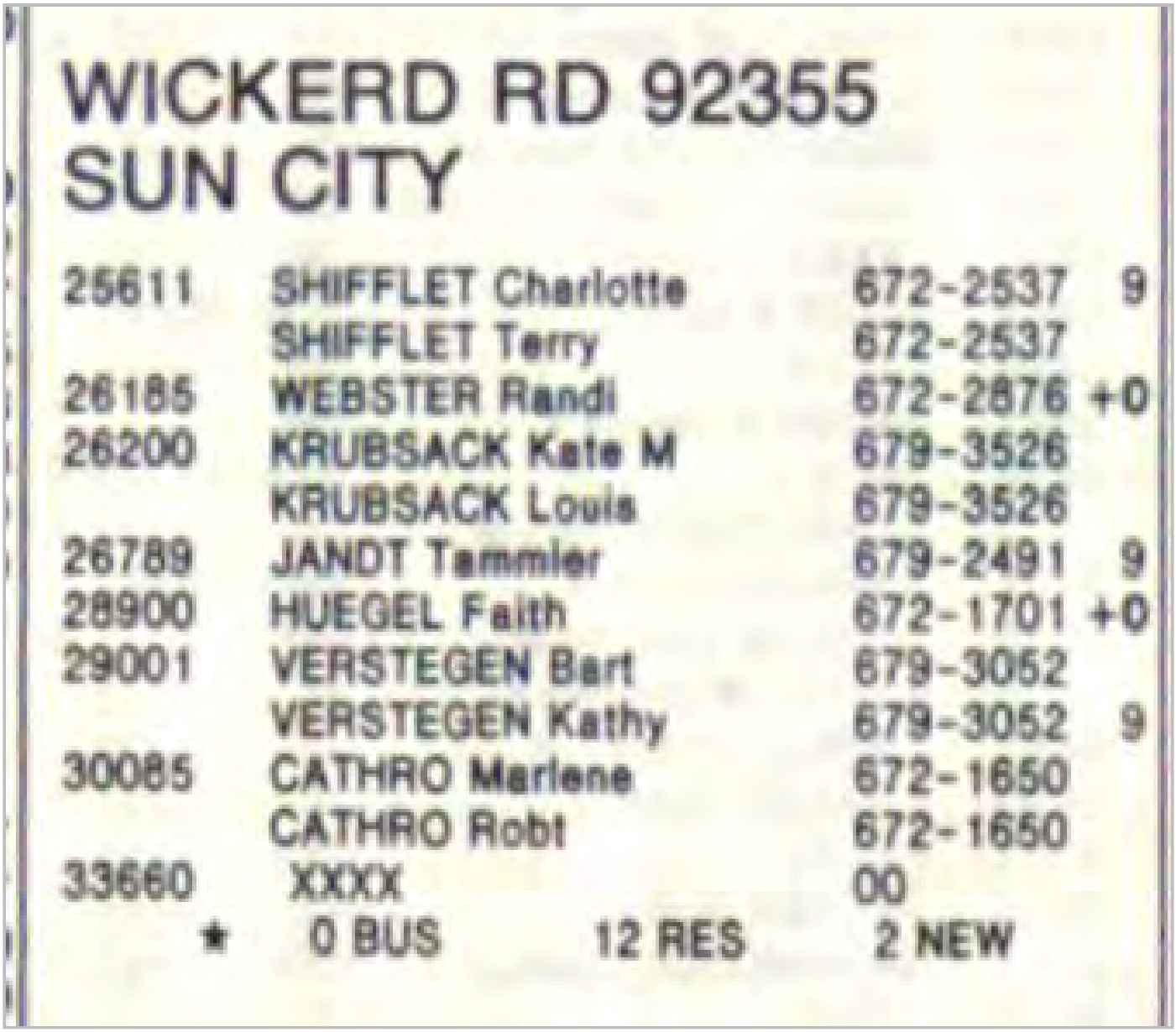
29771	KOLBAS Ralph	679-1216	
	KOLBAS Teresa	679-1216	9
29783	CHENG Gail	00	+0
29799	BOOTH Charles W	00	4
	DWYER Smith P	00	6
29802	BATES Carol	672-1739	+0
	BATES Leslie Rev	672-1739	+0
29811	MILLER Kerri	672-4207	9
29814	DAVENPORT Jeffery C	00	4
29825	MILLER Joanne Y	00	7
29826	VONHAGEL Alvin G	00	4
29840	MCKAY Mike	672-2985	+0
29841	RENAUD Larry A	672-1438	
	RENAUD Shaune	672-1438	
29856	GARRISON Stella	672-1025	+0
29872	HENNIGER Clifford A	00	+0
29873	**★REED RUSS MASONRY**	**679-5375**	5
	REED Russell F	00	4
29886	HATTER Tim A	00	4
	★MAD HATTERS PWR WSH	**672-4226**	+0
29887	CLAYTON Onita	672-3202	9
29899	HANKS Robt	679-6750	5
29902	PICKETT David	672-4108	+0
29913	XXXX	00	
29914	**★FORECAST CORP**	**679-2339**	9
29927	ARAUJO Robt	672-3371	7
29939	FOY James R	00	7
29953	FERGUSON Scott	672-3935	7
	SWANSON Beverly A	00	4
	WERNLI Frederick B	00	4
29956	**★MEADOWOOD HOMES**	**672-1937**	+0
29985	**★COLES COMMUNITIES**	**672-4961**	9

ZIP CODE 92355

32276	XXXX	00	
32355	BRADFORD Corby	672-3240	+0
32420	KEYS Ron	679-4535	9
32780	WILLIAMS David C	672-3867	7
32840	WILLIAMS Elizabeth	672-1518	+0
	WILLIAMS John	672-1518	+0
★	5 BUS 33 RES	12 NEW	

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

WICKERD RD 1990



WICKERD RD 92355
SUN CITY

25611	SHIFFLET Charlotte	672-2537	9
	SHIFFLET Terry	672-2537	
26185	WEBSTER Randi	672-2876	+0
26200	KRUBSACK Kate M	679-3526	
	KRUBSACK Louis	679-3526	
26789	JANDT Tammier	679-2491	9
28900	HUEGEL Faith	672-1701	+0
29001	VERSTEGEN Bart	679-3052	
	VERSTEGEN Kathy	679-3052	9
30085	CATHRO Marlene	672-1650	
	CATHRO Robt	672-1650	
33660	XXXX	00	

★ 0 BUS 12 RES 2 NEW

Target Street	Cross Street	Source
-	✓	Haines Criss-Cross Directory

EVANS RD 1985

EVANS RD 92380
ROMOLAND

RURAL ROUTE 1

MENIFEE AREA

32233	JAMES FRED	679-8771 +5
32276	KRUBSACK GARY	679-4962 6

* 0 BUS 2 RES 1 NEW

EVANS RD 92381
SUN CITY

29771	ABDELKARIM HAYTHEM	672-2776 +5
29783	SNIDER C	679-6649 +5
29799	LAWLER TED	672-2880 +5
29811	DUHAMELL R E	672-2786 +5
29873	**REED RUSS MASONRY**	**679-5375 +5**
29887	ALLISON JAS R	679-9193 +5
29899	HANKS ROBT	679-6750 +5
29913	STILL RONALD J	672-1772 +5
29927	GAUTHIER PAUL	672-1074 +5
29953	**CHAMPAGNE FLIGHTS**	**672-1188 +5**

* 2 BUS 8 RES 10 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

WICKERD RD 1985

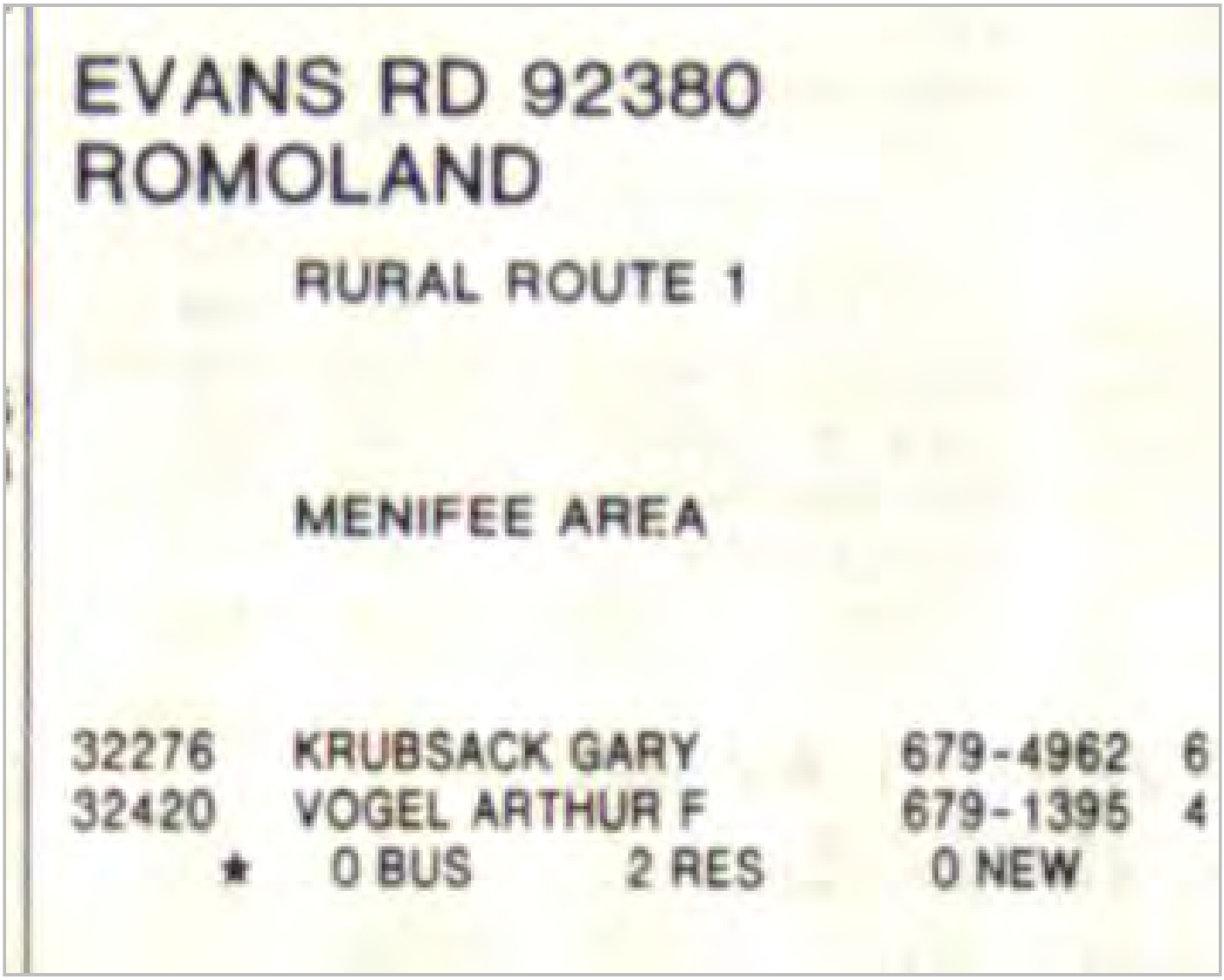
WICKERD RD 92380
ROMOLAND

26185	WICKERD JOYCE	679-4141
26200	KRUBSACK LOUIS	679-3526
26501	WILLIAMS J D	679-3768 +5
26789	HUGHES LEO	679-5530 +5
	KENNEDY M	672-2035 +5
26993	XXXX	00
30085	CATHRO ROBT	672-1650 +5
32900	XXXX	00
33680	FARWELL RAY	679-1940 +5

* 0 BUS 9 RES 5 NEW

Target Street	Cross Street	Source
-	✓	Haines Criss-Cross Directory

EVANS RD 1980



EVANS RD 92380
ROMOLAND

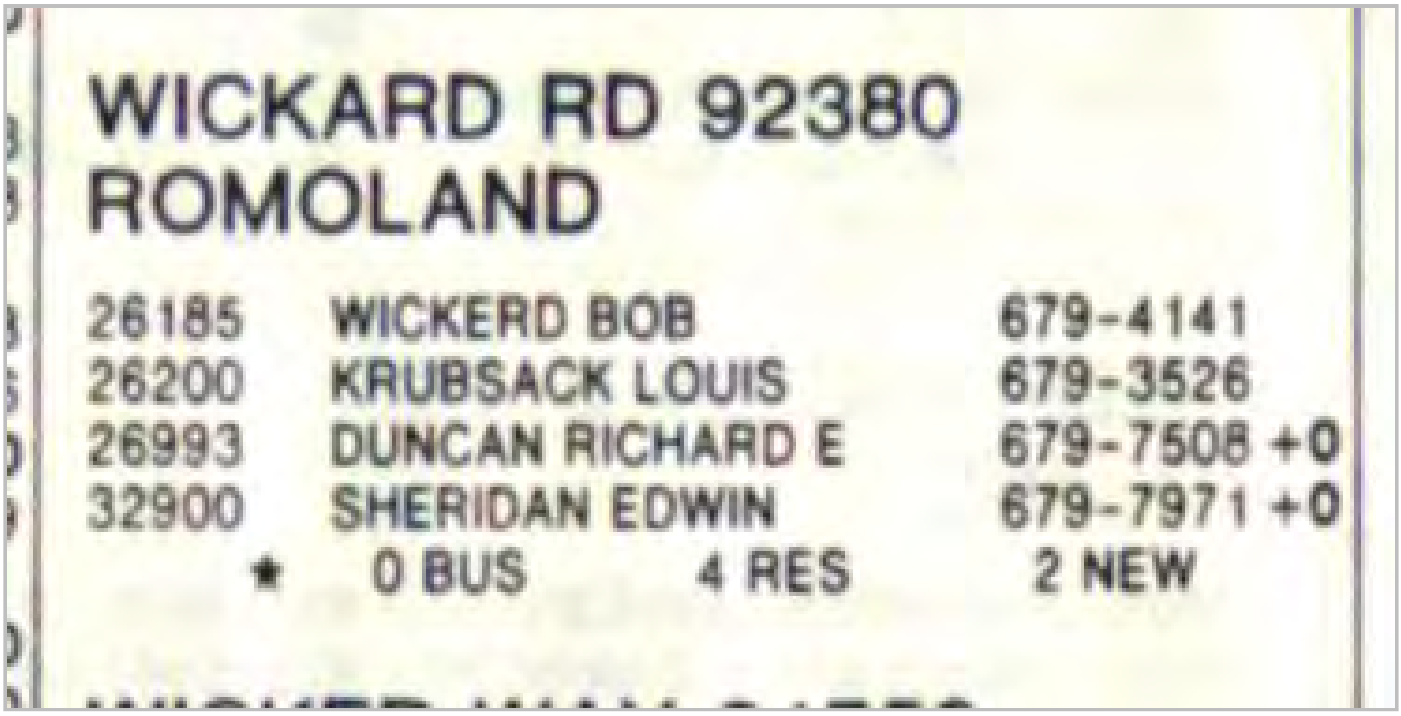
RURAL ROUTE 1

MENIFEE AREA

32276	KRUBSACK GARY	679-4962 6
32420	VOGEL ARTHUR F	679-1395 4
*	0 BUS 2 RES	0 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

WICKERD RD 1980



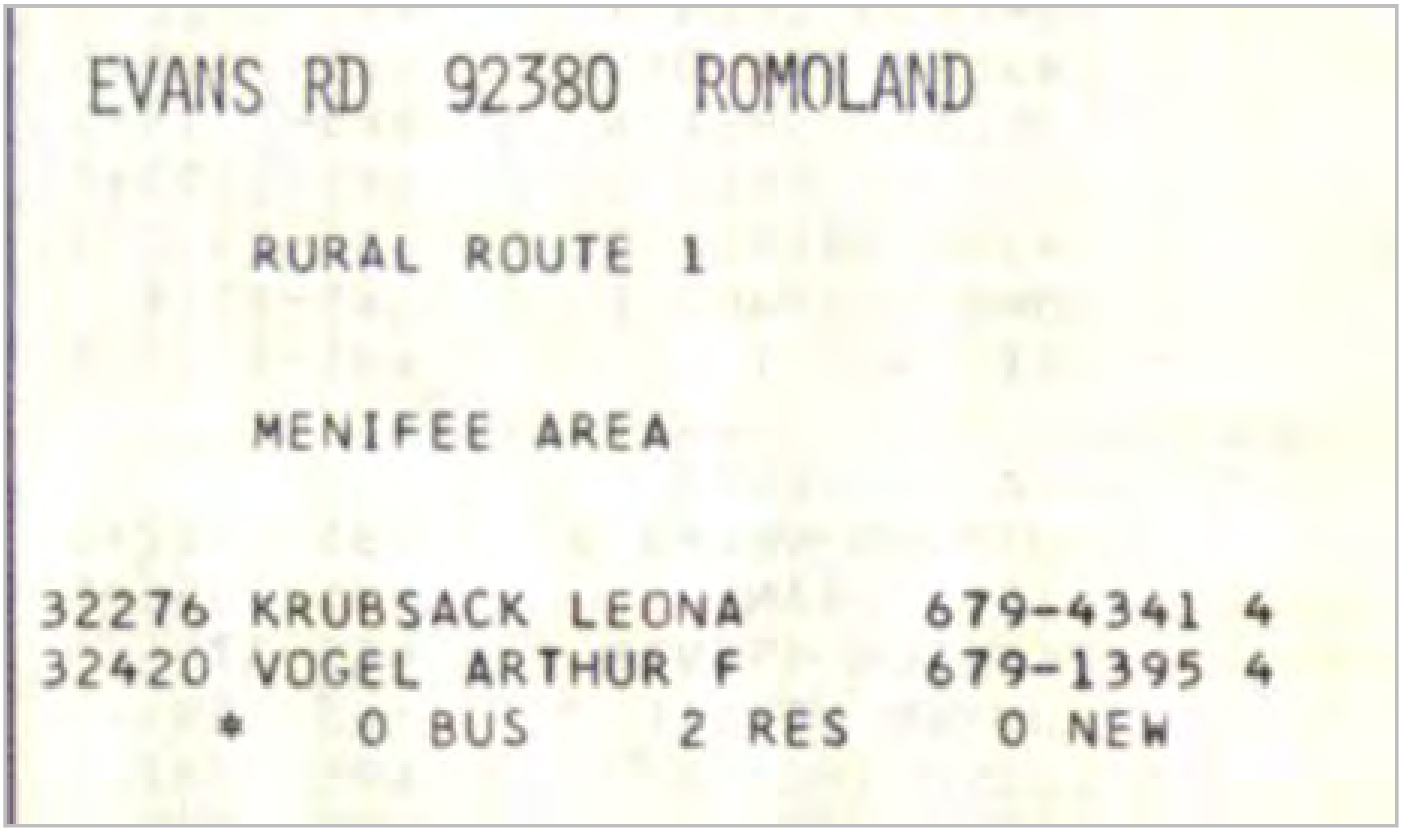
WICKARD RD 92380
ROMOLAND

26185	WICKERD BOB	679-4141
26200	KRUBSACK LOUIS	679-3526
26993	DUNCAN RICHARD E	679-7508 +0
32900	SHERIDAN EDWIN	679-7971 +0

* 0 BUS 4 RES 2 NEW

Target Street	Cross Street	Source
-	✓	Haines Criss-Cross Directory

EVANS RD 1975



EVANS RD 92380 ROMOLAND

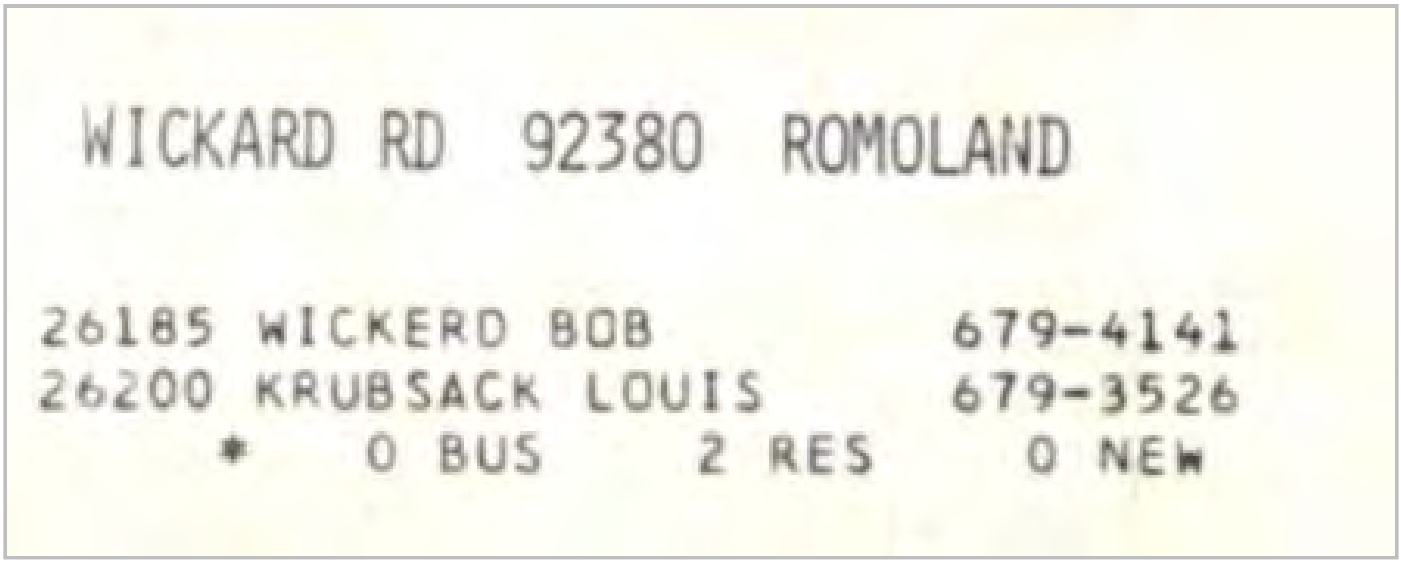
RURAL ROUTE 1

MENIFEE AREA

32276 KRUBSACK LEONA 679-4341 4
32420 VOGEL ARTHUR F 679-1395 4
* 0 BUS 2 RES 0 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

WICKERD RD 1975



WICKARD RD 92380 ROMOLAND

26185 WICKERD BOB 679-4141
26200 KRUBSACK LOUIS 679-3526
* 0 BUS 2 RES 0 NEW

APPENDIX E

REGULATORY RECORDS DOCUMENTATION

Wickerd Road
Wickerd Road
Menifee, CA 92584

Inquiry Number: 05010285.2r
August 01, 2017

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Physical Setting SSURGO Soil Map	A-5
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Physical Setting Source Records Searched	PSGR-1

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

WICKERD ROAD
MENIFEE, CA 92584

COORDINATES

Latitude (North):	33.6519480 - 33° 39' 7.01''
Longitude (West):	117.1936070 - 117° 11' 36.98''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	482047.8
UTM Y (Meters):	3723389.2
Elevation:	1529 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5641314 ROMOLAND, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140603
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
WICKERD ROAD
MENIFEE, CA 92584

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	MENIFEE UNION SCHOOL	26301 GARBONI RD	LUST	Lower	1246, 0.236, WNW
A2	MAINTENANCE OPERATIO	26301 GARBANI RD	HIST CORTESE, WDS	Lower	1246, 0.236, WNW
A3	MENIFEE UNION SCHOOL	26301 GARBONI RD	SWEEPS UST	Lower	1246, 0.236, WNW
B4	GTE MURRIETA PLANT Y	32477 HAUN RD	LUST, SWEEPS UST, CA FID UST, HIST CORTESE	Lower	2635, 0.499, East
B5	GTE-MURRIETA PLANT Y	32477 HAUN RD	LUST	Lower	2639, 0.500, East
6	PERRIS UNION HIGH SC	31375 BRADLEY ROAD	ENVIROSTOR, SCH	Lower	2965, 0.562, NNE
7	PALOMA HIGH SCHOOL E	31375 BRADLEY ROAD	ENVIROSTOR, SCH	Lower	3397, 0.643, North

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List

US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE ---------- State Response Sites

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Information System

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land
SLIC ---------- Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
UST ---------- Active UST Facilities
AST ---------- Aboveground Petroleum Storage Tank Facilities
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing
VCP ---------- Voluntary Cleanup Program Properties

State and tribal Brownfields sites

BROWNFIELDS ---------- Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT ---------- Waste Management Unit Database
SWRCY ---------- Recycler Database
HAULERS ---------- Registered Waste Tire Haulers Listing
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory
IHS OPEN DUMPS ---------- Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- Delisted National Clandestine Laboratory Register

HIST Cal-Sites ---- Historical Calsites Database
SCH ---- School Property Evaluation Program
CDL ---- Clandestine Drug Labs
Toxic Pits ---- Toxic Pits Cleanup Act Sites
US CDL ---- National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

HIST UST ---- Hazardous Substance Storage Container Database
CA FID UST ---- Facility Inventory Database

Local Land Records

LIENS ---- Environmental Liens Listing
LIENS 2 ---- CERCLA Lien Information
DEED ---- Deed Restriction Listing

Records of Emergency Release Reports

HMIRS ---- Hazardous Materials Information Reporting System
CHMIRS ---- California Hazardous Material Incident Report System
LDS ---- Land Disposal Sites Listing
MCS ---- Military Cleanup Sites Listing
SPILLS 90 ---- SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ---- RCRA - Non Generators / No Longer Regulated
FUDS ---- Formerly Used Defense Sites
DOD ---- Department of Defense Sites
SCRD DRYCLEANERS ---- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ---- Financial Assurance Information
EPA WATCH LIST ---- EPA WATCH LIST
2020 COR ACTION ---- 2020 Corrective Action Program List
TSCA ---- Toxic Substances Control Act
TRIS ---- Toxic Chemical Release Inventory System
SSTS ---- Section 7 Tracking Systems
ROD ---- Records Of Decision
RMP ---- Risk Management Plans
RAATS ---- RCRA Administrative Action Tracking System
PRP ---- Potentially Responsible Parties
PADS ---- PCB Activity Database System
ICIS ---- Integrated Compliance Information System
FTTS ---- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ---- Material Licensing Tracking System
COAL ASH DOE ---- Steam-Electric Plant Operation Data
COAL ASH EPA ---- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ---- PCB Transformer Registration Database
RADINFO ---- Radiation Information Database
HIST FTTS ---- FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ---- Incident and Accident Data
CONSENT ---- Superfund (CERCLA) Consent Decrees
INDIAN RESERV ---- Indian Reservations
FUSRAP ---- Formerly Utilized Sites Remedial Action Program

UMTRA ---- Uranium Mill Tailings Sites
LEAD SMELTERS ---- Lead Smelter Sites
US AIRS ---- Aerometric Information Retrieval System Facility Subsystem
US MINES ---- Mines Master Index File
ABANDONED MINES ---- Abandoned Mines
FINDS ---- Facility Index System/Facility Registry System
UXO ---- Unexploded Ordnance Sites
ECHO ---- Enforcement & Compliance History Information
DOCKET HWC ---- Hazardous Waste Compliance Docket Listing
FUELS PROGRAM ---- EPA Fuels Program Registered Listing
CA BOND EXP. PLAN ---- Bond Expenditure Plan
Cortese ---- "Cortese" Hazardous Waste & Substances Sites List
CUPA Listings ---- CUPA Resources List
DRYCLEANERS ---- Cleaner Facilities
EMI ---- Emissions Inventory Data
ENF ---- Enforcement Action Listing
Financial Assurance ---- Financial Assurance Information Listing
HAZNET ---- Facility and Manifest Data
ICE ---- ICE
HWP ---- EnviroStor Permitted Facilities Listing
HWT ---- Registered Hazardous Waste Transporter Database
MINES ---- Mines Site Location Listing
MWMP ---- Medical Waste Management Program Listing
NPDES ---- NPDES Permits Listing
PEST LIC ---- Pesticide Regulation Licenses Listing
PROC ---- Certified Processors Database
Notify 65 ---- Proposition 65 Records
UIC ---- UIC Listing
WASTEWATER PITS ---- Oil Wastewater Pits Listing
WDS ---- Waste Discharge System
WIP ---- Well Investigation Program Case List

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---- EDR Proprietary Manufactured Gas Plants
EDR Hist Auto ---- EDR Exclusive Historic Gas Stations
EDR Hist Cleaner ---- EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---- Recovered Government Archive Solid Waste Facilities List
RGA LUST ---- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 01/30/2017 has revealed that there are 2 ENVIROSTOR sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
PERRIS UNION HIGH SC	***31375 BRADLEY ROAD***	***NNE 1/2 - 1 (0.562 mi.)***	***6***	***18***
Facility Id: 33880002				
Status: No Action Required				
PALOMA HIGH SCHOOL E	***31375 BRADLEY ROAD***	***N 1/2 - 1 (0.643 mi.)***	***7***	***20***
Facility Id: 70000072				
Status: No Action Required				

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 3 LUST sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MENIFEE UNION SCHOOL	26301 GARBONI RD	WNW 1/8 - 1/4 (0.236 mi.)	A1	8
Database: RIVERSIDE CO. LUST, Date of Government Version: 04/18/2017				
Database: LUST REG 8, Date of Government Version: 02/14/2005				
Database: LUST, Date of Government Version: 03/13/2017				
Status: Completed - Case Closed				
Facility Status: Case Closed				
Facility Id: 96091				
Global Id: T0606500451				
Facility Status: 9				
Global ID: T0606500451				
GTE MURRIETA PLANT Y	***32477 HAUN RD***	***E 1/4 - 1/2 (0.499 mi.)***	***B4***	***12***
Database: LUST REG 8, Date of Government Version: 02/14/2005				
Facility Status: Case Closed				
Global ID: T0606500529				
GTE-MURRIETA PLANT Y	32477 HAUN RD	E 1/4 - 1/2 (0.500 mi.)	B5	15
Database: RIVERSIDE CO. LUST, Date of Government Version: 04/18/2017				
Database: LUST, Date of Government Version: 03/13/2017				

Status: Completed - Case Closed
Facility Id: 971216
Global Id: T0606500529
Facility Status: 9

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is 1 SWEEPS UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MENIFEE UNION SCHOOL Status: A Tank Status: A Comp Number: 90184	26301 GARBONI RD	WNW 1/8 - 1/4 (0.236 mi.)	A3	12

Other Ascertainable Records

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

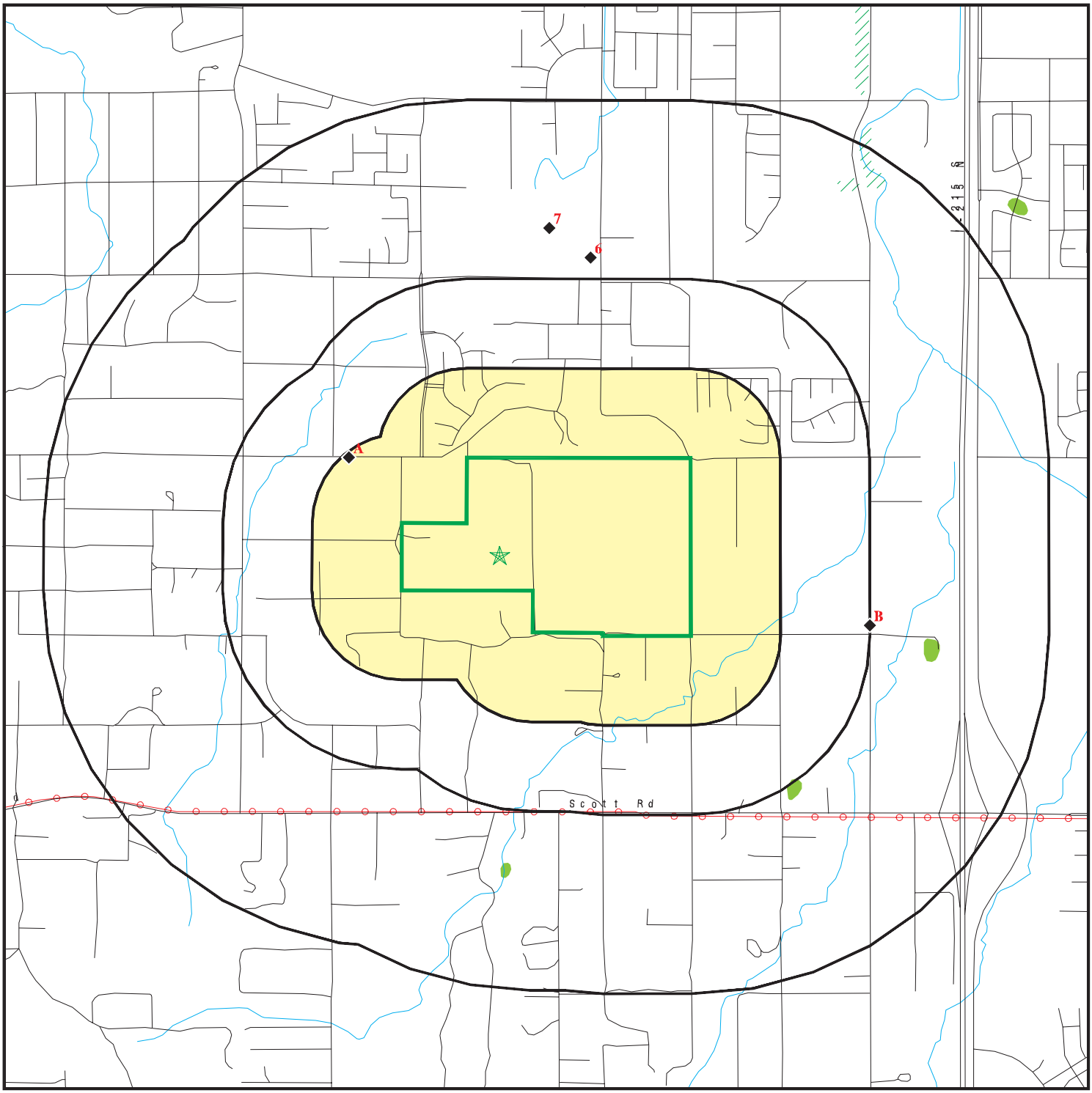
A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 2 HIST CORTESE sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MAINTENANCE OPERATIO Reg Id: 083302792T	***26301 GARBANI RD***	***WNW 1/8 - 1/4 (0.236 mi.)***	***A2***	***10***
GTE MURRIETA PLANT Y Reg Id: 083303193T	***32477 HAUN RD***	***E 1/4 - 1/2 (0.499 mi.)***	***B4***	***12***

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 05010285.2R



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

100-year flood zone

500-year flood zone

National Wetland Inventory

State Wetlands

Upgradient Area

Areas of Concern

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Wickerd Road ADDRESS: Wickerd Road Menifee CA 92584 LAT/LONG: 33.651948 / 117.193607	CLIENT: Hillmann Environmental Co. CONTACT: Kristine Savona INQUIRY #: 05010285.2r DATE: August 01, 2017 7:32 pm

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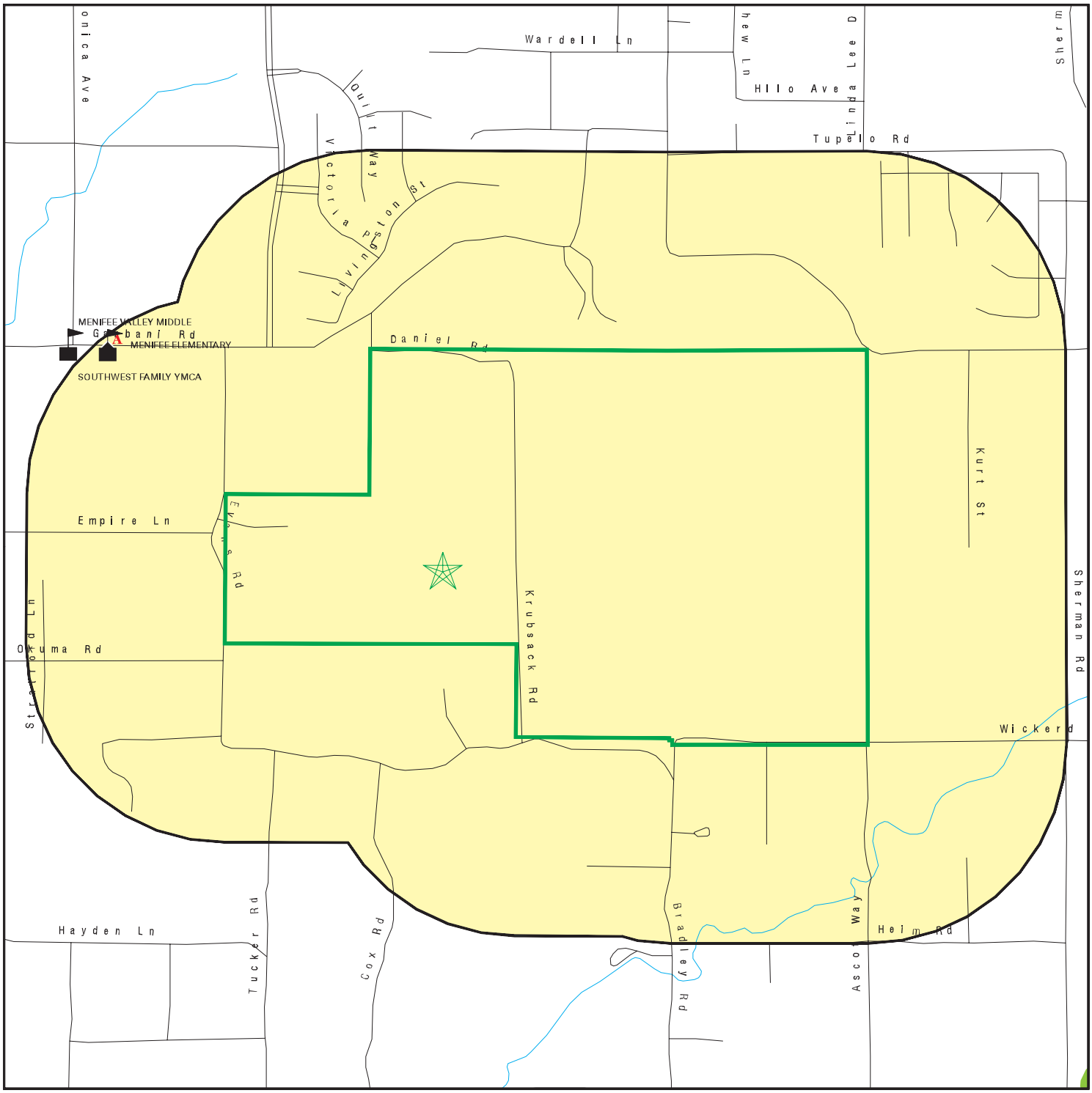
DETAIL MAP - 05010285.2R



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

0 1/8 1/4 1/2 Miles

- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Wickerd Road ADDRESS: Wickerd Road Menifee CA 92584 LAT/LONG: 33.651948 / 117.193607	CLIENT: Hillmann Environmental Co. CONTACT: Kristine Savona INQUIRY #: 05010285.2r DATE: August 01, 2017 7:34 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	2	NR	2
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	1	2	NR	NR	3

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	1	NR	NR	NR	1
HIST UST	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	0.001		0	NR	NR	NR	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.001		0	NR	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HAZNET	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	1	1	NR	NR	2
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.001		0	NR	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	0	3	3	2	0	8

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1
WNW
1/8-1/4
0.236 mi.
1246 ft.

MENIFEE UNION SCHOOL DIST.
26301 GARBONI RD
MENIFEE, CA 92058

Site 1 of 3 in cluster A

LUST **U002244632**
N/A

Relative:
Lower

Actual:
1518 ft.

LUST:

Region:	STATE
Global Id:	T0606500451
Latitude:	33.6591486
Longitude:	-117.1886961
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	11/04/2003
Lead Agency:	RIVERSIDE COUNTY LOP
Case Worker:	UNK
Local Agency:	RIVERSIDE COUNTY LOP
RB Case Number:	083302792T
LOC Case Number:	96091
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606500451
Contact Type:	Regional Board Caseworker
Contact Name:	CARL BERNHARDT
Organization Name:	SANTA ANA RWQCB (REGION 8)
Address:	3737 MAIN STREET, SUITE 500
City:	RIVERSIDE
Email:	cbernhardt@waterboards.ca.gov
Phone Number:	9517824495

Global Id:	T0606500451
Contact Type:	Local Agency Caseworker
Contact Name:	UNK
Organization Name:	RIVERSIDE COUNTY LOP
Address:	3880 LEMON ST SUITE 200
City:	RIVERSIDE
Email:	Not reported
Phone Number:	Not reported

Status History:

Global Id:	T0606500451
Status:	Completed - Case Closed
Status Date:	11/04/2003

Global Id:	T0606500451
Status:	Open - Case Begin Date
Status Date:	01/31/1996

Global Id:	T0606500451
Status:	Open - Site Assessment
Status Date:	01/31/1996

Global Id:	T0606500451

MENIFEE UNION SCHOOL DIST. (Continued) **U002244632**

Status: Open - Site Assessment
Status Date: 04/30/1996

Global Id: T0606500451
Status: Open - Site Assessment
Status Date: 06/17/1996

Global Id: T0606500451
Status: Open - Site Assessment
Status Date: 09/12/1996

Regulatory Activities:
Global Id: T0606500451
Action Type: Other
Date: 02/01/1996
Action: Leak Reported

Global Id: T0606500451
Action Type: ENFORCEMENT
Date: 12/30/2002
Action: Technical Correspondence / Assistance / Other

Global Id: T0606500451
Action Type: Other
Date: 01/31/1996
Action: Leak Discovery

Global Id: T0606500451
Action Type: Other
Date: 01/31/1996
Action: Leak Stopped

LUST REG 8:
Region: 8
County: Riverside
Regional Board: Santa Ana Region
Facility Status: Case Closed
Case Number: 083302792T
Local Case Num: 96091
Case Type: Aquifer affected
Substance: Gasoline
Qty Leaked: Not reported
Abate Method: Not reported
Cross Street: MENIFEE
Enf Type: TA-CLO
Funding: Not reported
How Discovered: Tank Closure
How Stopped: Not reported
Leak Cause: UNK
Leak Source: Tank
Global ID: T0606500451
How Stopped Date: 1/31/1996
Enter Date: 3/19/1996
Date Confirmation of Leak Began: 1/31/1996
Date Preliminary Assessment Began: 6/17/1996

MENIFEE UNION SCHOOL DIST. (Continued) **U002244632**

Discover Date:	1/31/1996
Enforcement Date:	Not reported
Close Date:	11/4/2003
Date Prelim Assessment Workplan Submitted:	4/30/1996
Date Pollution Characterization Began:	9/12/1996
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	3/19/1996
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.6591486
Longitude:	-117.1886961
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	1
MTBE Tested:	Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
MTBE Class:	*
Staff:	CAB
Staff Initials:	UNK
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	SAN JACINTO (8-5)
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: Not reported

RIVERSIDE CO. LUST:

Region:	RIVERSIDE
Facility ID:	96091
Employee:	Winters
Site Closed:	Yes
Case Type:	Drinking Water Aquifer affected
Facility Status:	closed/action completed
Casetype Decode:	An Aquifer used for Drinking Water supply has been contaminated.
Fstatus Decode:	Closed/Action completed

A2 **MAINTENANCE OPERATIONS & TRA** **HIST CORTESE** **S103978701**
WNW **26301 GARBANI RD** **WDS** **N/A**
1/8-1/4 **MENIFEE, CA 92584**
0.236 mi.
1246 ft. **Site 2 of 3 in cluster A**

Relative:
Lower

Actual:
1518 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	33
Reg By:	LTNKA
Reg Id:	083302792T

MAINTENANCE OPERATIONS & TRA (Continued) **S103978701**

WDS:

Facility ID:	Santa Ana River 33I017951
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board
Subregion:	8
Facility Telephone:	9096796833
Facility Contact:	BROWN DAVID
Agency Name:	MENIFEE UNION SCHOOL DISTRICT
Agency Address:	30205 MENIFEE ROAD
Agency City,St,Zip:	MENIFEE 92584
Agency Contact:	DAN WOOD
Agency Telephone:	Not reported
Agency Type:	Special District (Includes districts established under general acts, sanitary districts, water districts irrigation districts, etc.)
SIC Code:	0
SIC Code 2:	Not reported
Primary Waste Type:	Not reported
Primary Waste:	Not reported
Waste Type2:	Not reported
Waste2:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	Not reported
POTW:	Not reported
Treat To Water:	Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.
Complexity:	Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

A3 **MENIFEE UNION SCHOOL DISTRICT** **SWEEPS UST** **S103821010**
WNW **26301 GARBONI RD** **N/A**
1/8-1/4 **MENIFEE, CA 92584**
0.236 mi.
1246 ft. **Site 3 of 3 in cluster A**

Relative:
Lower

Actual:
1518 ft.

SWEEPS UST:

Status:	Active
Comp Number:	90184
Number:	6
Board Of Equalization:	44-676096
Referral Date:	01-07-94
Action Date:	05-16-94
Created Date:	05-16-94
Owner Tank Id:	1
SWRCB Tank Id:	33-000-090184-000001
Tank Status:	A
Capacity:	550
Active Date:	01-07-94
Tank Use:	M.V. FUEL
STG:	P
Content:	PRM UNLEADED
Number Of Tanks:	1

B4 **GTE MURRIETA PLANT YARD** **LUST** **S101590033**
East **32477 HAUN RD** **SWEEPS UST** **N/A**
1/4-1/2 **MURRIETA, CA 92362** **CA FID UST**
0.499 mi. **HIST CORTESE**
2635 ft. **Site 1 of 2 in cluster B**

Relative:
Lower

Actual:
1499 ft.

LUST REG 8:

Region:	8
County:	Riverside
Regional Board:	Santa Ana Region
Facility Status:	Case Closed
Case Number:	083303193T
Local Case Num:	Not reported
Case Type:	Soil only
Substance:	Gasoline
Qty Leaked:	Not reported
Abate Method:	Excavate and Dispose - remove contaminated soil and dispose in approved site
Cross Street:	Not reported
Enf Type:	CLOS
Funding:	Not reported
How Discovered:	Not reported
How Stopped:	Not reported
Leak Cause:	Not reported
Leak Source:	Not reported
Global ID:	T0606500529
How Stopped Date:	Not reported
Enter Date:	7/10/1998
Date Confirmation of Leak Began:	Not reported
Date Preliminary Assessment Began:	Not reported
Discover Date:	11/18/1997
Enforcement Date:	Not reported
Close Date:	7/14/1999
Date Prelim Assessment Workplan Submitted:	9/22/1997
Date Pollution Characterization Began:	Not reported
Date Remediation Plan Submitted:	Not reported

GTE MURRIETA PLANT YARD (Continued) **S101590033**

Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	7/10/1998
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.553886
Longitude:	-117.213921
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	3
Max MTBE Soil:	Not reported
MTBE Fuel:	1
MTBE Tested:	MTBE Detected. Site tested for MTBE & MTBE detected
MTBE Class:	*
Staff:	NOM
Staff Initials:	UNK
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	TEMECULA VALLEY (9-5
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: TANKS REMOVED.

SWEEPS UST:

Status:	Active
Comp Number:	67035
Number:	1
Board Of Equalization:	44-018497
Referral Date:	10-29-92
Action Date:	10-29-92
Created Date:	02-16-89
Owner Tank Id:	000126
SWRCB Tank Id:	33-000-067035-000001
Tank Status:	A
Capacity:	12000
Active Date:	10-29-92
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	6

Status:	Active
Comp Number:	67035
Number:	1
Board Of Equalization:	44-018497
Referral Date:	10-29-92
Action Date:	10-29-92
Created Date:	02-16-89
Owner Tank Id:	000126
SWRCB Tank Id:	33-000-067035-000002
Tank Status:	A

GTE MURRIETA PLANT YARD (Continued) **S101590033**

Capacity: 12000
Active Date: 10-29-92
Tank Use: M.V. FUEL
STG: P
Content: DIESEL
Number Of Tanks: Not reported

Status: Active
Comp Number: 67035
Number: 1
Board Of Equalization: 44-018497
Referral Date: 10-29-92
Action Date: 10-29-92
Created Date: 02-16-89
Owner Tank Id: 000126
SWRCB Tank Id: 33-000-067035-000003
Tank Status: A
Capacity: 500
Active Date: 10-29-92
Tank Use: OIL
STG: W
Content: WASTE OIL
Number Of Tanks: Not reported

Status: Active
Comp Number: 67035
Number: 1
Board Of Equalization: 44-018497
Referral Date: 10-29-92
Action Date: 10-29-92
Created Date: 02-16-89
Owner Tank Id: 000126
SWRCB Tank Id: 33-000-067035-000004
Tank Status: A
Capacity: 350
Active Date: 10-29-92
Tank Use: HAZARDOUS
STG: P
Content: ANTI-FREEZE
Number Of Tanks: Not reported

Status: Active
Comp Number: 67035
Number: 1
Board Of Equalization: 44-018497
Referral Date: 10-29-92
Action Date: 10-29-92
Created Date: 02-16-89
Owner Tank Id: 000126
SWRCB Tank Id: 33-000-067035-000005
Tank Status: A
Capacity: 350
Active Date: 10-29-92
Tank Use: CHEMICAL
STG: P
Content: SAFETY CLEAN
Number Of Tanks: Not reported

GTE MURRIETA PLANT YARD (Continued) **S101590033**

Status:	Active
Comp Number:	67035
Number:	1
Board Of Equalization:	44-018497
Referral Date:	10-29-92
Action Date:	10-29-92
Created Date:	02-16-89
Owner Tank Id:	000126
SWRCB Tank Id:	33-000-067035-000006
Tank Status:	A
Capacity:	350
Active Date:	10-29-92
Tank Use:	UNKNOWN
STG:	W
Content:	Not reported
Number Of Tanks:	Not reported

CA FID UST:

Facility ID:	33002644
Regulated By:	UTNKA
Regulated ID:	Not reported
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	7146276261
Mail To:	Not reported
Mailing Address:	P O BOX 725
Mailing Address 2:	Not reported
Mailing City,St,Zip:	MURRIETA 92362
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported
NPDES Number:	Not reported
EPA ID:	Not reported
Comments:	Not reported
Status:	Active

HIST CORTESE:

Region:	CORTESE
Facility County Code:	33
Reg By:	LTNKA
Reg Id:	083303193T

B5 **GTE-MURRIETA PLANT YARD** **LUST** **S103821084**
East **32477 HAUN RD** **N/A**
1/4-1/2 **MURRIETA, CA**
0.500 mi.
2639 ft. **Site 2 of 2 in cluster B**

Relative:
Lower

Actual:
1499 ft.

LUST:

Region:	STATE
Global Id:	T0606500529
Latitude:	33.6496887109401
Longitude:	-117.176332543655
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	11/30/1999
Lead Agency:	RIVERSIDE COUNTY LOP

GTE-MURRIETA PLANT YARD (Continued) **S103821084**

Case Worker:	SCB
Local Agency:	RIVERSIDE COUNTY LOP
RB Case Number:	083303193T
LOC Case Number:	971216
File Location:	Local Agency Warehouse
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606500529
Contact Type:	Regional Board Caseworker
Contact Name:	NANCY OLSON-MARTIN
Organization Name:	SANTA ANA RWQCB (REGION 8)
Address:	3737 MAIN STREET, SUITE 500
City:	RIVERSIDE
Email:	nolson-martin@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606500529
Contact Type:	Local Agency Caseworker
Contact Name:	SHARON BOLTINGHOUSE
Organization Name:	RIVERSIDE COUNTY LOP
Address:	3880 LEMON ST SUITE 200
City:	RIVERSIDE
Email:	sbolting@rivcocha.org
Phone Number:	9519558980

Status History:

Global Id:	T0606500529
Status:	Completed - Case Closed
Status Date:	11/30/1999

Global Id:	T0606500529
Status:	Open - Case Begin Date
Status Date:	11/18/1997

Global Id:	T0606500529
Status:	Open - Site Assessment
Status Date:	12/04/1997

Global Id:	T0606500529
Status:	Open - Site Assessment
Status Date:	05/14/1998

Regulatory Activities:

Global Id:	T0606500529
Action Type:	Other
Date:	12/04/1997
Action:	Leak Reported

Global Id:	T0606500529
Action Type:	ENFORCEMENT
Date:	11/30/1999
Action:	Closure/No Further Action Letter - #RCDEH113099

GTE-MURRIETA PLANT YARD (Continued) **S103821084**

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 03/05/1998
Action: * No Action

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 03/16/1998
Action: Notice of Responsibility

Global Id: T0606500529
Action Type: Other
Date: 11/18/1997
Action: Leak Discovery

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 11/29/1999
Action: File review - #RCDEH Upload Site File 5/15/2016

Global Id: T0606500529
Action Type: RESPONSE
Date: 08/20/1998
Action: Soil and Water Investigation Report

Global Id: T0606500529
Action Type: RESPONSE
Date: 03/05/1998
Action: Tank Removal Report / UST Sampling Report

Global Id: T0606500529
Action Type: RESPONSE
Date: 12/04/1997
Action: Unauthorized Release Form

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 07/13/1999
Action: Technical Correspondence / Assistance / Other

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 05/07/1998
Action: Meeting

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 08/20/1998
Action: File review

Global Id: T0606500529
Action Type: REMEDIATION
Date: 06/24/1997
Action: Excavation

GTE-MURRIETA PLANT YARD (Continued) **S103821084**

RIVERSIDE CO. LUST:

Region:	RIVERSIDE
Facility ID:	971216
Employee:	Malloy
Site Closed:	Yes
Case Type:	Drinking Water Aquifer affected
Facility Status:	closed/action completed
Casetype Decode:	An Aquifer used for Drinking Water supply has been contaminated.
Fstatus Decode:	Closed/Action completed

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6 **PERRIS UNION HIGH SCH/PALOMA VALLEY SITE** **ENVIROSTOR** **S118756757**
NNE **31375 BRADLEY ROAD** **SCH** **N/A**
1/2-1 **PERRIS, CA 92571**
0.562 mi.
2965 ft.

Relative:
Lower

Actual:
1475 ft.

ENVIROSTOR:

Facility ID:	33880002
Status:	No Action Required
Status Date:	06/23/2000
Site Code:	404107
Site Type:	School Investigation
Site Type Detailed:	School
Acres:	56.53
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Javier Hinojosa
Division Branch:	Southern California Schools & Brownfields Outreach
Assembly:	67
Senate:	23
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	School District
Latitude:	33.6641
Longitude:	-117.1892
APN:	NONE SPECIFIED
Past Use:	NONE
Potential COC:	NONE SPECIFIED No Contaminants found
Confirmed COC:	NONE SPECIFIED
Potential Description:	NMA
Alias Name:	PERRIS UNION HIGH SCH/PALOMA VALLEY SITE
Alias Type:	Alternate Name
Alias Name:	404107
Alias Type:	Project Code (Site Code)
Alias Name:	33880002
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Phase 1
Completed Date:	06/23/2000
Comments:	Not reported
Future Area Name:	Not reported

PERRIS UNION HIGH SCH/PALOMA VALLEY SITE (Continued) **S118756757**

Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

SCH:

Facility ID: 33880002
Site Type: School Investigation
Site Type Detail: School
Site Mgmt. Req.: NONE SPECIFIED
Acres: 56.53
National Priorities List: NO
Cleanup Oversight Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Lead Agency Description: Not reported
Project Manager: Not reported
Supervisor: Javier Hinojosa
Division Branch: Southern California Schools & Brownfields Outreach
Site Code: 404107
Assembly: 67
Senate: 23
Special Program Status: Not reported
Status: No Action Required
Status Date: 06/23/2000
Restricted Use: NO
Funding: School District
Latitude: 33.6641
Longitude: -117.1892
APN: NONE SPECIFIED
Past Use: NONE
Potential COC: NONE SPECIFIED, No Contaminants found
Confirmed COC: NONE SPECIFIED
Potential Description: NMA
Alias Name: PERRIS UNION HIGH SCH/PALOMA VALLEY SITE
Alias Type: Alternate Name
Alias Name: 404107
Alias Type: Project Code (Site Code)
Alias Name: 33880002
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 06/23/2000
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported

PERRIS UNION HIGH SCH/PALOMA VALLEY SITE (Continued) **S118756757**

Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

7
North
1/2-1
0.643 mi.
3397 ft.

PALOMA HIGH SCHOOL EXPANSION
31375 BRADLEY ROAD
MENIFEE, CA 92584

ENVIROSTOR SCH **S118757364 N/A**

Relative:
Lower

Actual:
1474 ft.

ENVIROSTOR:
Facility ID: 70000072
Status: No Action Required
Status Date: 06/01/2006
Site Code: 404657
Site Type: School Investigation
Site Type Detailed: School
Acres: 56.5
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Amit Pathak
Supervisor: Shahir Haddad
Division Branch: Southern California Schools & Brownfields Outreach
Assembly: 67
Senate: 23
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: School District
Latitude: 33.6653
Longitude: -117.1912
APN: NONE SPECIFIED
Past Use: AGRICULTURAL - ROW CROPS, SCHOOL - OTHER
Potential COC: Arsenic Chlordane Total Chromium (1:6 ratio Cr VI:Cr III DDD DDE DDT Endrin Lead Toxaphene
Confirmed COC: 30001-NO 30004-NO 30005-NO 30006-NO 30007-NO 30008-NO 30010-NO 30013-NO 30023-NO
Potential Description: NMA
Alias Name: 404657
Alias Type: Project Code (Site Code)
Alias Name: 70000072
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 11/04/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 12/13/2005
Comments: Not reported

PALOMA HIGH SCHOOL EXPANSION (Continued) **S118757364**

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

SCH:

Facility ID:	70000072
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	56.5
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Amit Pathak
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Site Code:	404657
Assembly:	67
Senate:	23
Special Program Status:	Not reported
Status:	No Action Required
Status Date:	06/01/2006
Restricted Use:	NO
Funding:	School District
Latitude:	33.6653
Longitude:	-117.1912
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS, SCHOOL - OTHER
Potential COC:	Arsenic, Chlordane, Total Chromium (1:6 ratio Cr VI:Cr III, DDD, DDE, DDT, Endrin, Lead, Toxaphene
Confirmed COC:	30001-NO, 30004-NO, 30005-NO, 30006-NO, 30007-NO, 30008-NO, 30010-NO, 30013-NO, 30023-NO
Potential Description:	NMA
Alias Name:	404657
Alias Type:	Project Code (Site Code)
Alias Name:	70000072
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Phase 1
Completed Date:	11/04/2005
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	12/13/2005

PALOMA HIGH SCHOOL EXPANSION (Continued) **S118757364**

Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

Count: 0 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/05/2017
Date Data Arrived at EDR: 04/21/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 21

Source: EPA
Telephone: N/A
Last EDR Contact: 07/07/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/05/2017
Date Data Arrived at EDR: 04/21/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 21

Source: EPA
Telephone: N/A
Last EDR Contact: 07/07/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/05/2017
Date Data Arrived at EDR: 04/21/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 21

Source: EPA
Telephone: N/A
Last EDR Contact: 07/07/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 92

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 07/07/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/07/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 02/07/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 07/28/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/12/2016
Date Data Arrived at EDR: 12/28/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 44

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/12/2016
Date Data Arrived at EDR: 12/28/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/12/2016
Date Data Arrived at EDR: 12/28/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/12/2016
Date Data Arrived at EDR: 12/28/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/12/2016
Date Data Arrived at EDR: 12/28/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/28/2016
Date Data Arrived at EDR: 01/04/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 93

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/15/2017
Next Scheduled EDR Contact: 08/28/2017
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/13/2017
Date Data Arrived at EDR: 02/28/2017
Date Made Active in Reports: 06/09/2017
Number of Days to Update: 101

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/31/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/13/2017
Date Data Arrived at EDR: 02/28/2017
Date Made Active in Reports: 06/09/2017
Number of Days to Update: 101

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/31/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/26/2016
Date Data Arrived at EDR: 09/29/2016
Date Made Active in Reports: 11/11/2016
Number of Days to Update: 43

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 06/28/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 01/30/2017
Date Data Arrived at EDR: 01/31/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 112

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/02/2017
Next Scheduled EDR Contact: 08/14/2017
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 01/30/2017
Date Data Arrived at EDR: 01/31/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 112

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/02/2017
Next Scheduled EDR Contact: 08/14/2017
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/13/2017
Date Data Arrived at EDR: 02/15/2017
Date Made Active in Reports: 05/02/2017
Number of Days to Update: 76

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 05/17/2017
Next Scheduled EDR Contact: 08/28/2017
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)
Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/13/2017
Date Data Arrived at EDR: 03/14/2017
Date Made Active in Reports: 05/02/2017
Number of Days to Update: 49
Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Quarterly

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22
Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30
Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29
Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 11/14/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/28/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Semi-Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 10/07/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/06/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 10/01/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 11/14/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/17/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 09/01/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/13/2017
Date Data Arrived at EDR: 03/14/2017
Date Made Active in Reports: 05/02/2017
Number of Days to Update: 49
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 07/14/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 03/12/2017
Date Data Arrived at EDR: 03/16/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 57
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69
Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 06/21/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 01/14/2017
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 10/01/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/01/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/17/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/06/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99
Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 11/14/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/28/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Semi-Annually

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 10/07/2016
Date Data Arrived at EDR: 01/26/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 99

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 06/27/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 01/30/2017
Date Data Arrived at EDR: 01/31/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 112

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/02/2017
Next Scheduled EDR Contact: 08/14/2017
Data Release Frequency: Quarterly

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 01/03/2017
Date Data Arrived at EDR: 01/04/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 57
Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 06/28/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 03/02/2017
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 36
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/20/2017
Next Scheduled EDR Contact: 10/02/2017
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30
Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 03/13/2017
Date Data Arrived at EDR: 03/14/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 50
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 01/13/2017
Date Data Arrived at EDR: 01/17/2017
Date Made Active in Reports: 05/31/2017
Number of Days to Update: 134
Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 05/15/2017
Next Scheduled EDR Contact: 08/28/2017
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 05/01/2017
Next Scheduled EDR Contact: 08/14/2017
Data Release Frequency: Varies

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/24/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176
Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/14/2017
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 02/09/2017
Date Data Arrived at EDR: 03/08/2017
Date Made Active in Reports: 06/09/2017
Number of Days to Update: 93
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/28/2017
Next Scheduled EDR Contact: 06/12/2017
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 01/30/2017
Date Data Arrived at EDR: 01/31/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 112

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/02/2017
Next Scheduled EDR Contact: 08/14/2017
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 03/17/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 54

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 07/14/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/09/2017
Date Data Arrived at EDR: 03/08/2017
Date Made Active in Reports: 06/09/2017
Number of Days to Update: 93

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/31/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 03/17/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 67

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 05/24/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 03/06/2017
Date Data Arrived at EDR: 03/07/2017
Date Made Active in Reports: 04/21/2017
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/02/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 07/26/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 03/06/2017
Date Data Arrived at EDR: 03/07/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 77

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 06/06/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/28/2016
Date Data Arrived at EDR: 12/28/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 37

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 06/28/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/06/2016
Date Data Arrived at EDR: 01/25/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 105

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/26/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/13/2017
Date Data Arrived at EDR: 03/14/2017
Date Made Active in Reports: 05/02/2017
Number of Days to Update: 49

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/13/2017
Date Data Arrived at EDR: 03/14/2017
Date Made Active in Reports: 05/02/2017
Number of Days to Update: 49

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/12/2016
Date Data Arrived at EDR: 12/28/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Varies

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/24/2017
Next Scheduled EDR Contact: 06/05/2017
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/12/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 07/14/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/19/2017
Next Scheduled EDR Contact: 08/28/2017
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 02/13/2017
Date Data Arrived at EDR: 02/15/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 05/17/2017
Next Scheduled EDR Contact: 08/28/2017
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/08/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 14

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 06/21/2017
Next Scheduled EDR Contact: 10/02/2017
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 133

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/26/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/28/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/09/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 02/01/2017
Date Data Arrived at EDR: 02/09/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 07/24/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3
Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 06/06/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 01/20/2016
Date Data Arrived at EDR: 04/28/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 127
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/10/2017
Next Scheduled EDR Contact: 07/24/2017
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 07/28/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 05/19/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 05/19/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 05/08/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 06/05/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/05/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 07/28/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/04/2017
Date Data Arrived at EDR: 01/06/2017
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 35
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 07/12/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 05/02/2017
Next Scheduled EDR Contact: 08/14/2017
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2016
Date Data Arrived at EDR: 11/18/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 77

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 06/21/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 09/30/2015
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 05/26/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 07/11/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 12/23/2016
Date Data Arrived at EDR: 12/27/2016
Date Made Active in Reports: 02/17/2017
Number of Days to Update: 52

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 12/05/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 07/07/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 06/21/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 06/21/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/08/2017
Date Data Arrived at EDR: 02/28/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 38

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 05/31/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/31/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 06/02/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/14/2017
Date Data Arrived at EDR: 03/17/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 21

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 06/09/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/04/2017
Date Data Arrived at EDR: 04/07/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 35

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 06/07/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 03/19/2017
Date Data Arrived at EDR: 03/21/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 06/07/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 10/25/2015
Date Data Arrived at EDR: 01/29/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 67

Source: Department of Defense
Telephone: 571-373-0407
Last EDR Contact: 07/17/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 06/02/2016
Date Data Arrived at EDR: 06/03/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 91
Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 05/24/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/22/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 79
Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/24/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6
Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 12/28/2016
Date Data Arrived at EDR: 12/28/2016
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 64
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 06/28/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 04/11/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 42
Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 07/13/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Annually

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 09/23/2016
Date Made Active in Reports: 10/24/2016
Number of Days to Update: 31
Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 06/23/2017
Next Scheduled EDR Contact: 10/02/2017
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 01/23/2017
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/25/2017
Number of Days to Update: 118

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 07/19/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 04/25/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 53

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 02/14/2017
Date Data Arrived at EDR: 02/17/2017
Date Made Active in Reports: 05/25/2017
Number of Days to Update: 97

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 05/15/2017
Next Scheduled EDR Contact: 08/28/2017
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 10/12/2016
Date Made Active in Reports: 12/15/2016
Number of Days to Update: 64

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 07/12/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 11/21/2016
Date Data Arrived at EDR: 11/22/2016
Date Made Active in Reports: 01/23/2017
Number of Days to Update: 62

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 05/24/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/21/2016
Date Data Arrived at EDR: 11/22/2016
Date Made Active in Reports: 01/23/2017
Number of Days to Update: 62
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/24/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 04/11/2017
Date Data Arrived at EDR: 04/13/2017
Date Made Active in Reports: 04/26/2017
Number of Days to Update: 13
Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 07/12/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 09/12/2016
Date Data Arrived at EDR: 09/14/2016
Date Made Active in Reports: 10/14/2016
Number of Days to Update: 30
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Varies

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 12/02/2016
Date Data Arrived at EDR: 12/06/2016
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 86
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 06/06/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 11/14/2016
Date Data Arrived at EDR: 11/15/2016
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 107
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 05/17/2017
Next Scheduled EDR Contact: 08/28/2017
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 12/06/2016
Date Data Arrived at EDR: 12/06/2016
Date Made Active in Reports: 03/03/2017
Number of Days to Update: 87
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 06/07/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 03/13/2017
Date Data Arrived at EDR: 03/14/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 50
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 12/16/2016
Date Data Arrived at EDR: 12/22/2016
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 70
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 06/16/2017
Next Scheduled EDR Contact: 10/02/2017
Data Release Frequency: No Update Planned

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 01/20/2017
Date Data Arrived at EDR: 03/14/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 50
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water board?s review found that more than one-third of the region?s active disposal pits are operating without permission.

Date of Government Version: 04/15/2015
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/23/2015
Number of Days to Update: 67
Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 07/14/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9
Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Quarterly

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 06/27/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 04/10/2017
Date Data Arrived at EDR: 04/11/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 31

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/07/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/10/2017
Date Data Arrived at EDR: 04/11/2017
Date Made Active in Reports: 05/02/2017
Number of Days to Update: 21

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/07/2017
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 03/06/2017
Date Data Arrived at EDR: 03/08/2017
Date Made Active in Reports: 04/14/2017
Number of Days to Update: 37

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 06/16/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

Date of Government Version: 01/31/2017
Date Data Arrived at EDR: 02/07/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 94

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 07/19/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 06/27/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 02/23/2017
Date Data Arrived at EDR: 02/24/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 77

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 06/02/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 05/26/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 07/27/2017
Number of Days to Update: 58

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 07/31/2017
Next Scheduled EDR Contact: 11/13/2017
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 01/31/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/14/2017
Number of Days to Update: 70

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/13/2017
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 02/24/2017
Date Data Arrived at EDR: 02/28/2017
Date Made Active in Reports: 05/12/2017
Number of Days to Update: 73

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 07/31/2017
Next Scheduled EDR Contact: 11/13/2017
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 04/06/2017
Date Data Arrived at EDR: 04/07/2017
Date Made Active in Reports: 05/17/2017
Number of Days to Update: 40

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 12/02/2016
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 05/25/2017
Number of Days to Update: 111

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 03/20/2017
Date Data Arrived at EDR: 03/21/2017
Date Made Active in Reports: 05/17/2017
Number of Days to Update: 57

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 01/23/2017
Date Data Arrived at EDR: 01/25/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 36

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

INYO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List
Cupa facility list.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 03/09/2017
Date Made Active in Reports: 05/25/2017
Number of Days to Update: 77

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 06/02/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 02/07/2017
Date Data Arrived at EDR: 02/10/2017
Date Made Active in Reports: 05/02/2017
Number of Days to Update: 81

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 03/06/2017
Date Data Arrived at EDR: 03/07/2017
Date Made Active in Reports: 05/17/2017
Number of Days to Update: 71

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/18/2017
Date Data Arrived at EDR: 01/20/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 41

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 07/17/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 11/30/2016
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 05/25/2017
Number of Days to Update: 111

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206
Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 06/16/2017
Next Scheduled EDR Contact: 10/02/2017
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 11/14/2016
Date Data Arrived at EDR: 11/18/2016
Date Made Active in Reports: 01/23/2017
Number of Days to Update: 66
Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 07/07/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/17/2017
Date Data Arrived at EDR: 04/18/2017
Date Made Active in Reports: 05/02/2017
Number of Days to Update: 14
Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 07/18/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2016
Date Data Arrived at EDR: 01/26/2016
Date Made Active in Reports: 03/22/2016
Number of Days to Update: 56
Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/13/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 03/29/2016
Date Data Arrived at EDR: 04/06/2016
Date Made Active in Reports: 06/13/2016
Number of Days to Update: 68
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 07/17/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/17/2017
Date Data Arrived at EDR: 01/18/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 112
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 07/13/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 03/10/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 54
Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/10/2017
Date Data Arrived at EDR: 01/13/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 110

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 07/07/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 03/03/2017
Date Data Arrived at EDR: 03/07/2017
Date Made Active in Reports: 05/17/2017
Number of Days to Update: 71

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 03/31/2017
Date Data Arrived at EDR: 04/06/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 27

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 02/22/2017
Date Data Arrived at EDR: 02/23/2017
Date Made Active in Reports: 05/17/2017
Number of Days to Update: 83

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 07/13/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 02/21/2017
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 05/17/2017
Number of Days to Update: 76

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 05/24/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Varies

MONTEREY COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 06/24/2016
Date Data Arrived at EDR: 06/27/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 43

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/24/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 03/15/2017
Date Data Arrived at EDR: 03/16/2017
Date Made Active in Reports: 05/09/2017
Number of Days to Update: 54

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/24/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 02/09/2017
Date Data Arrived at EDR: 02/10/2017
Date Made Active in Reports: 05/17/2017
Number of Days to Update: 96

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/13/2017
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 02/06/2017
Date Data Arrived at EDR: 02/10/2017
Date Made Active in Reports: 04/21/2017
Number of Days to Update: 70

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/08/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 11/04/2016
Date Data Arrived at EDR: 11/11/2016
Date Made Active in Reports: 01/23/2017
Number of Days to Update: 73

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/08/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 02/06/2017
Date Data Arrived at EDR: 02/07/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 85

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/09/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 09/02/2016
Date Data Arrived at EDR: 09/06/2016
Date Made Active in Reports: 10/14/2016
Number of Days to Update: 38

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 06/02/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 01/31/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 05/25/2017
Number of Days to Update: 111

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 04/18/2017
Date Data Arrived at EDR: 04/20/2017
Date Made Active in Reports: 04/21/2017
Number of Days to Update: 1

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/19/2017
Next Scheduled EDR Contact: 10/02/2017
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 01/19/2017
Date Data Arrived at EDR: 01/25/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 98

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/19/2017
Next Scheduled EDR Contact: 10/02/2017
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 56

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/06/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/08/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 56

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/06/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 11/30/2016
Date Data Arrived at EDR: 02/09/2017
Date Made Active in Reports: 05/25/2017
Number of Days to Update: 105

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 12/09/2016
Date Data Arrived at EDR: 12/13/2016
Date Made Active in Reports: 03/03/2017
Number of Days to Update: 80

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 05/08/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 10/05/2016
Date Data Arrived at EDR: 12/06/2016
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 86

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 06/07/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Quarterly

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58
Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 06/05/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 02/28/2017
Date Data Arrived at EDR: 03/02/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 62
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 03/21/2017
Date Data Arrived at EDR: 03/23/2017
Date Made Active in Reports: 05/09/2017
Number of Days to Update: 47
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 06/16/2017
Next Scheduled EDR Contact: 10/02/2017
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 02/21/2017
Date Data Arrived at EDR: 02/21/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 91
Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 06/02/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 03/15/2017
Date Data Arrived at EDR: 04/07/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 33
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/09/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/15/2017
Date Data Arrived at EDR: 04/07/2017
Date Made Active in Reports: 04/21/2017
Number of Days to Update: 14
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/09/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28
Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 02/22/2017
Date Data Arrived at EDR: 02/23/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 89
Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22
Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 05/24/2017
Next Scheduled EDR Contact: 09/11/2017
Data Release Frequency: Annually

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 05/04/2017
Date Data Arrived at EDR: 05/08/2017
Date Made Active in Reports: 07/27/2017
Number of Days to Update: 80

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 03/14/2017
Date Data Arrived at EDR: 03/17/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 67

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 11/29/2016
Date Data Arrived at EDR: 12/21/2016
Date Made Active in Reports: 12/22/2016
Number of Days to Update: 1

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/09/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 03/15/2017
Date Data Arrived at EDR: 03/17/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 47

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/09/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 03/01/2017
Date Data Arrived at EDR: 03/30/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 54

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 06/21/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 01/04/2017
Date Data Arrived at EDR: 01/06/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 55

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 06/21/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 01/20/2017
Date Data Arrived at EDR: 01/24/2017
Date Made Active in Reports: 05/18/2017
Number of Days to Update: 114

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 07/17/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Varies

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 12/02/2016
Date Data Arrived at EDR: 12/06/2016
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 35

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 06/02/2017
Next Scheduled EDR Contact: 09/18/2017
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA Facility List

Cupa facilities

Date of Government Version: 01/05/2017
Date Data Arrived at EDR: 02/10/2017
Date Made Active in Reports: 05/25/2017
Number of Days to Update: 104

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 05/05/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 01/23/2017
Date Data Arrived at EDR: 01/25/2017
Date Made Active in Reports: 05/18/2017
Number of Days to Update: 113

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

TULARE COUNTY:

CUPA Facility List
Cupa program facilities

Date of Government Version: 01/05/2017
Date Data Arrived at EDR: 02/10/2017
Date Made Active in Reports: 05/25/2017
Number of Days to Update: 104

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 08/21/2017
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/25/2017
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 34

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 07/21/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 12/27/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 103

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/24/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/15/2017
Next Scheduled EDR Contact: 08/28/2017
Data Release Frequency: Quarterly

Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 09/26/2016
Date Data Arrived at EDR: 10/27/2016
Date Made Active in Reports: 01/24/2017
Number of Days to Update: 89

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 07/24/2017
Next Scheduled EDR Contact: 11/08/2017
Data Release Frequency: Quarterly

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 02/27/2017
Date Data Arrived at EDR: 03/15/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 49
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/14/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 03/31/2017
Date Data Arrived at EDR: 04/06/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 27
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 06/29/2017
Next Scheduled EDR Contact: 10/16/2017
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 01/30/2017
Date Data Arrived at EDR: 01/31/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 112
Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/27/2017
Next Scheduled EDR Contact: 11/13/2017
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45
Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/15/2017
Next Scheduled EDR Contact: 08/28/2017
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/11/2017
Date Made Active in Reports: 07/27/2017
Number of Days to Update: 107
Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/10/2017
Next Scheduled EDR Contact: 10/23/2017
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/30/2017
Date Data Arrived at EDR: 02/01/2017
Date Made Active in Reports: 02/13/2017
Number of Days to Update: 12
Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/03/2017
Next Scheduled EDR Contact: 08/14/2017
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 07/22/2016
Date Made Active in Reports: 11/22/2016
Number of Days to Update: 123
Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 07/17/2017
Next Scheduled EDR Contact: 10/30/2017
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 06/19/2015
Date Made Active in Reports: 07/15/2015
Number of Days to Update: 26
Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/22/2017
Next Scheduled EDR Contact: 09/04/2017
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/13/2017
Date Made Active in Reports: 07/14/2017
Number of Days to Update: 92
Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/12/2017
Next Scheduled EDR Contact: 09/25/2017
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

WICKERD ROAD
WICKERD ROAD
MENIFEE, CA 92584

TARGET PROPERTY COORDINATES

Latitude (North):	33.651948 - 33° 39' 7.01''
Longitude (West):	117.193607 - 117° 11' 36.99''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	482047.8
UTM Y (Meters):	3723389.2
Elevation:	1529 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5641314 ROMOLAND, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

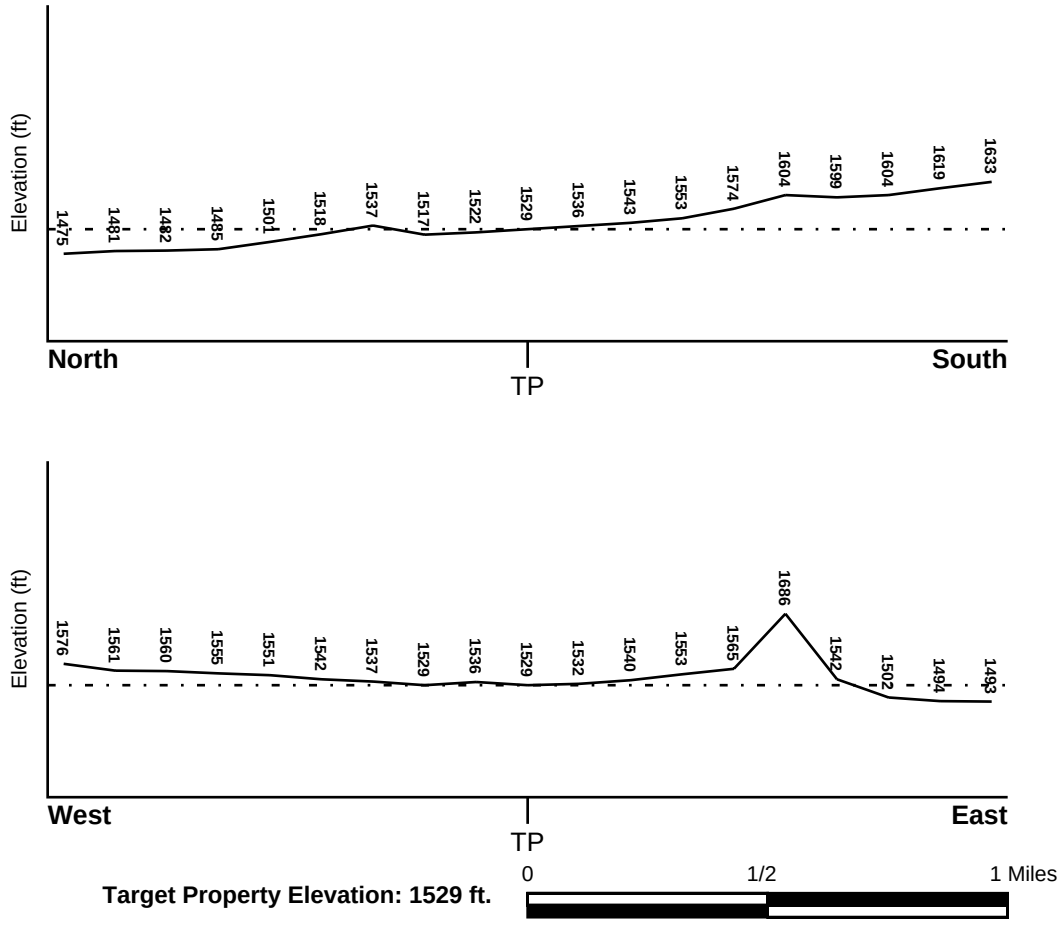
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 1529 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
0602452090B	FEMA Q3 Flood data

Additional Panels in search area:	FEMA Source Type
06065C2062G	FEMA FIRM Flood data
06065C2070H	FEMA FIRM Flood data
0602452095A	FEMA Q3 Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

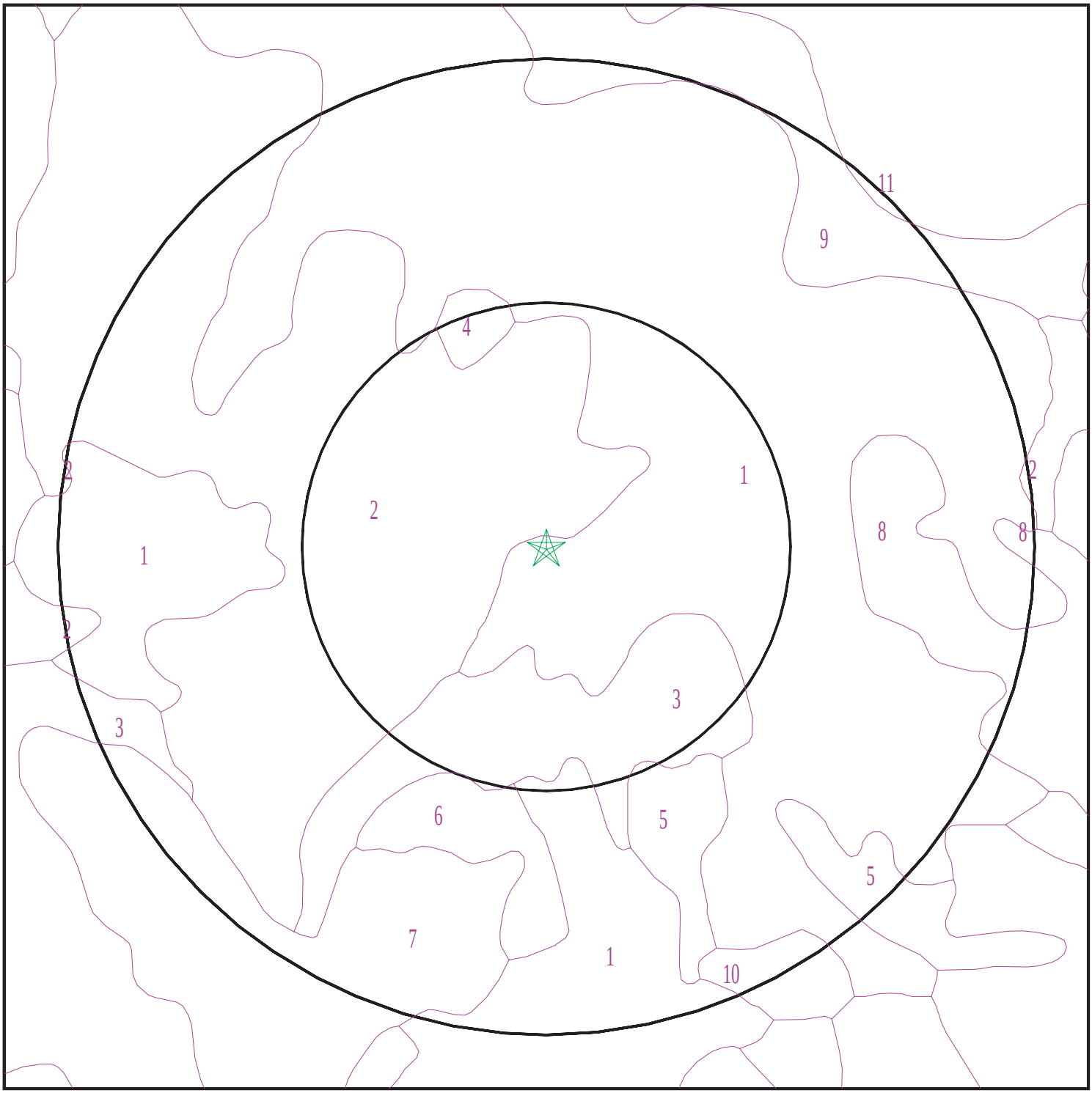
Era:	Mesozoic
System:	Cretaceous
Series:	Cretaceous granitic rocks
Code:	Kg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 05010285.2r



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Wickerd Road	CLIENT:	Hillmann Environmental Co.
ADDRESS:	Wickerd Road Menifee CA 92584	CONTACT:	Kristine Savona
LAT/LONG:	33.651948 / 117.193607	INQUIRY #:	05010285.2r
		DATE:	August 01, 2017 7:35 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: WYMAN

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	14 inches	35 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.8 Min: 6.1
3	35 inches	50 inches	stratified loam to clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	50 inches	59 inches	stratified loam to clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Map ID: 2

Soil Component Name: YOKOHL

Soil Surface Texture: loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	9 inches	25 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.42 Min: 0.01	Max: 7.3 Min: 6.1
3	25 inches	29 inches	indurated	Not reported	Not reported	Max: 0.01 Min: 0	Max: Min:
4	29 inches	59 inches	stratified sandy loam to gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6

Soil Map ID: 3

Soil Component Name: HONCUT

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.3 Min: 5.6
2	22 inches	59 inches	coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 6.1

Soil Map ID: 4

Soil Component Name: CIENEBA

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.3 Min: 5.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	14 inches	22 inches	weathered bedrock	Not reported	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 5

Soil Component Name: YOKOHL

Soil Surface Texture: loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	5 inches	20 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.42 Min: 0.01	Max: 7.3 Min: 6.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	20 inches	24 inches	indurated	Not reported	Not reported	Max: 0.01 Min: 0	Max: Min:
4	24 inches	59 inches	stratified sandy loam to gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6

Soil Map ID: 6

Soil Component Name: HANFORD

Soil Surface Texture: coarse sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 5.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	7 inches	40 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 5.6
3	40 inches	59 inches	stratified loamy sand to coarse sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.6

Soil Map ID: 7

Soil Component Name: CAJALCO

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.3 Min: 6.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	12 inches	18 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.3 Min: 6.6
3	18 inches	61 inches	weathered bedrock	Not reported	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 8

Soil Component Name: VALLECITOS

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 127 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	7 inches	27 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 7.8 Min: 6.1
3	27 inches	48 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 8.4 Min: 7.4
4	48 inches	51 inches	unweathered bedrock	Not reported	Not reported	Max: 4 Min: 1.4	Max: Min:

Soil Map ID: 9

Soil Component Name: HONCUT

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.3 Min: 5.6
2	22 inches	59 inches	coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 6.1

Soil Map ID: 10

Soil Component Name: CAJALCO

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.3 Min: 6.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	12 inches	18 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.3 Min: 6.6
3	18 inches	61 inches	weathered bedrock	Not reported	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 11

Soil Component Name: LAS POSAS

Soil Surface Texture: stony loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	stony loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	5 inches	20 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 7.8 Min: 6.6
3	20 inches	24 inches	weathered bedrock	Not reported	Not reported	Max: 0.42 Min: 0	Max: Min:

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 0.001 miles
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS40000136350	1/4 - 1/2 Mile WSW
2	USGS40000136292	1/2 - 1 Mile South
A3	USGS40000136467	1/2 - 1 Mile NNW
4	USGS40000136398	1/2 - 1 Mile WNW
6	USGS40000136468	1/2 - 1 Mile NNW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

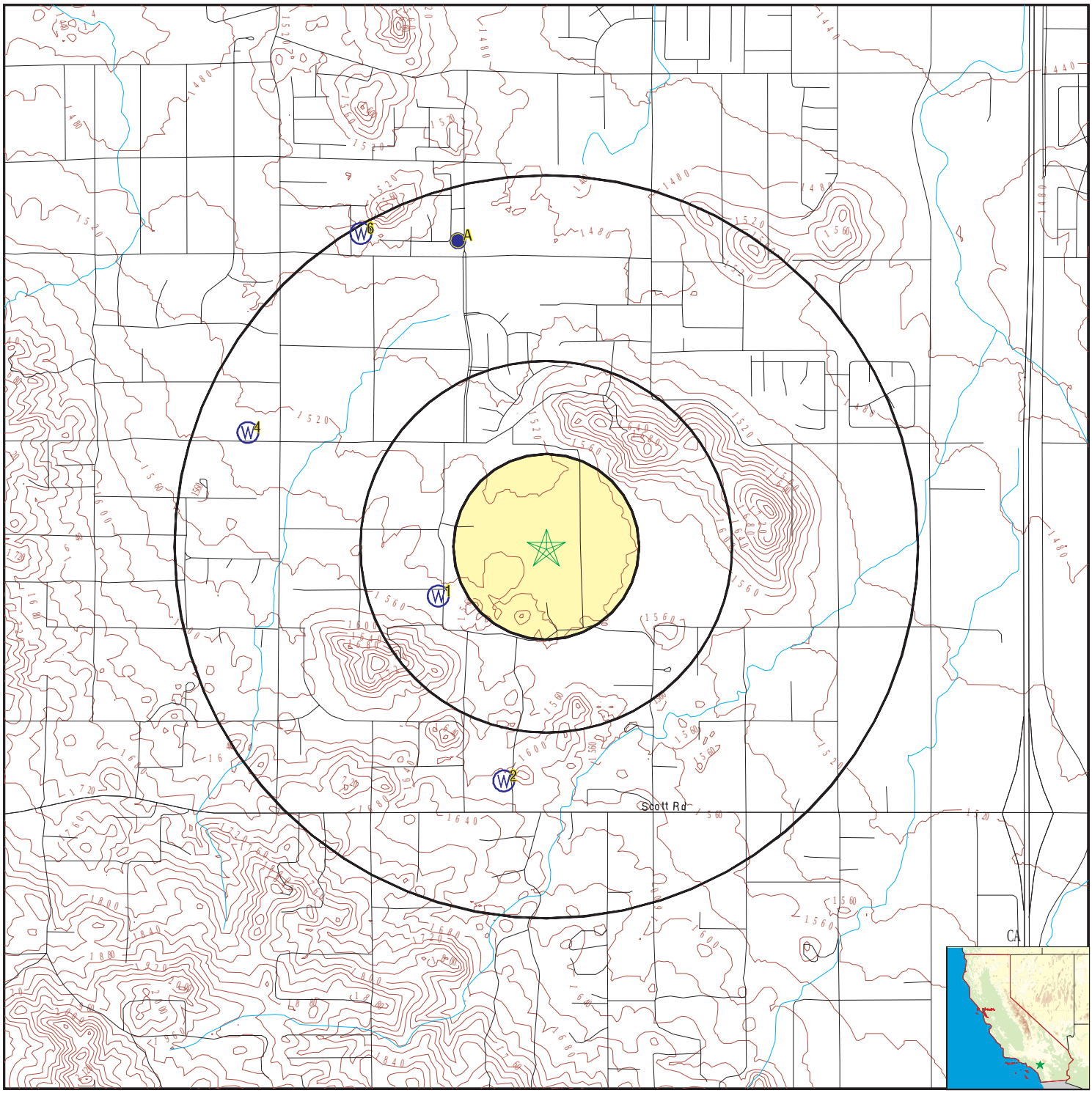
Note: PWS System location is not always the same as well location.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A5	CADW60000034422	1/2 - 1 Mile NNW

PHYSICAL SETTING SOURCE MAP - 05010285.2r



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME: Wickerd Road	CLIENT: Hillmann Environmental Co.
ADDRESS: Wickerd Road Menifee CA 92584	CONTACT: Kristine Savona
LAT/LONG: 33.651948 / 117.193607	INQUIRY #: 05010285.2r DATE: August 01, 2017 7:35 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
WSW **FED USGS** **USGS40000136350**
1/4 - 1/2 Mile
Higher

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-333900117115201		
Monloc name:	006S003W16F001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18070202	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.6500228
Longitude:	-117.1986453	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	1540
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	160
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

2
South **FED USGS** **USGS40000136292**
1/2 - 1 Mile
Higher

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-333834117114101		
Monloc name:	006S003W16Q001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18070202	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.6428008
Longitude:	-117.1955895	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	1600
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		

Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

A3
NNW **FED USGS** **USGS40000136467**
1/2 - 1 Mile
Lower

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-333950117114701		
Monloc name:	006S003W09G001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18070202	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.6639113
Longitude:	-117.1972564	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	1485
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1993-12-10	7.55	

Note: The site had been pumped recently.

4
WNW **FED USGS** **USGS40000136398**
1/2 - 1 Mile
Lower

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-333923117122401		
Monloc name:	006S003W08R001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18070202	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.6564115
Longitude:	-117.2075346	Sourcemap scale:	24000

Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	1525
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	250
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

A5
NNW
1/2 - 1 Mile
Lower

CA WELLS **CADW60000034422**

Objectid:	34422
Latitude:	33.6639
Longitude:	-117.1982
Site code:	336639N1171982W001
State well numbe:	06S03W09G001S
Local well name:	''
Well use id:	6
Well use descrip:	Unknown
County id:	33
County name:	Riverside
Basin code:	'8-5'
Basin desc:	San Jacinto
Dwr region id:	80238
Dwr region:	Southern Region Office
Site id:	CADW60000034422

6
NNW
1/2 - 1 Mile
Lower

FED USGS **USGS40000136468**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-333951117120501		
Monloc name:	006S003W09E001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18070202	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.6641891
Longitude:	-117.2022566	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	1500
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	150
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92584	3	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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APPENDIX F

OTHER DOCUMENTS
(where applicable)

SOUTH COAST AQMD

PUBLIC RECORDS REQUEST FORM

Request Information

Date Stored

Time Stored

Public Record Request Nbr

Public Record Request Tracking Nbr
94307

Attention Requestor

Please fill out this form completely. You may include an attachment to the form, if necessary.

Requestor Information

Requestor Name
Stephen Bartlett

Requestor Address
1745 W. Orangewood Avenue, Suite 110

Requestor Company
Hillmann Consulting

Requestor City
Orange

Requestor Email *
SBARTLETT@HILLMANNCONSULTING.COM

Requestor State
California

Requestor Phone
(714)634-9500

Requestor Zip Code
92868

Type of Requested Record(s).

REQUESTED RECORDS. **Please be as specific as possible in describing the records you are seeking.** The more specific you are, the easier it will be to determine if such records exist in District files. Please contact the Public Records Unit if you need assistance in identifying District records.

Note: Permits to Operate, Equipment Lists, Notices of Violation, Notices to Comply, and Emissions Summaries are available through SCAQMD's FIND page at http://www3.aqmd.gov/webappl/fim/prog/search.aspx (you need to copy and paste this link into your browser).

Please Enter a description of the records you are requesting here: *
Notices of violation, notices to comply, complaints, site inspection records, asbestos notifications/records

Time Period of Documents Requested

Start Date *
1/1/1917

End Date *
8/18/2017

Requested Facility or Site Information (if applicable)

Note: You may only include one Facility or Site per Form.

Facility ID (if known)

Address
27152 Garbani Road

Facility Name (if known)

City
Menifee

Zip Code
92584

Requested Application or Permit List. (if applicable)

Please click the Add Button to the right to enter a Application/Permit Number

Supplemental Attachments

Supplemental Documents

Note: Please use the above button for attaching additional documents that will help define your public records request.

Print

INSTRUCTIONS FOR REQUESTING RECORDS

(California Public Records Act, Govt. Code Sections 6250-6276.48)

1. In order to expedite your request, please fill out the form completely. Requests may also be submitted by phone at (909) 396-3700, by facsimile to (909) 396-3330, or by email to PublicRecordsRequests@aqmd.gov.

2. Requests must be for records prepared, owned, used, or retained by the District (Gov. Code Sec. 6252(e)). Requests should be for clearly identifiable records. The District is not required to create a new record in response to a request. The District will assist the requestor in making a request that describes reasonably identifiable records (Gov. Code Sec. 6253.1). Documents will not be provided if disclosure would infringe upon a copyright, trade secret, or is otherwise exempt in accordance with state law.

3. A search for facility records can only be conducted by one or all of the following:

-- a) Facility Name, Address, or Identification Number

-- b) Facility Application Number, or Permit to Operate Number; or

-- c) Facility Notice of Violation/Notice to Comply Number.

4. You will be notified within ten (10) days whether your request seeks copies of disclosable public records prepared, owned, used, or retained by this agency. In some cases, the District may need an additional 14 days to respond. If so, you will be notified in writing. You will also be provided an estimated date of when the records will be made available.

5. Communications regarding your request, and any records, will be provided by email, unless specified otherwise.

6. If the search for records finds the records voluminous, you will be notified of the approximate number of pages and/or length of time it will take to process your request.

7. If the records you requested have been marked confidential by the source of the record, you will be notified and given the option of continuing with the District's Trade Secret process.

8. If your request is to review records, rather than receive copies, the District will notify you once the records are gathered, and arrangements will be made for your review.

9. The charge for the direct cost of duplication is as follows: Paper Copies, $0.15/page each over 10 pages (first 10 pages are free); Copied CD's or flash drives, no charge; and Copied Audio Tapes, $5.00 each. After a preliminary estimate, advance payment may be required.

10. If the request is for information in an electronic format, the requestor shall bear the cost of producing a copy of the record, including the cost to construct the record and the cost of programming and computer services necessary to produce a copy of the record, when either of the following applies: (1) the District would be required to produce a copy of an electronic record and the record is one that is produced only at otherwise regularly scheduled intervals, or (2) the request would require data compilation, extraction, or programming to produce the record. (Gov. Code Sec. 6253.9(b)). The transfer of gathered electronic records onto CD, DVD or flash drive typically costs $10.00 each. An invoice will accompany your records when completed.

Note: For further information, please refer to the District's Guidelines for Implementing the California Public Records Act. The Guidelines are available in the lobby of the District Headquarters or on the District's web site at www.aqmd.gov.

Note: If you have questions pertaining to the submittal of a Public Records Act request, you may contact the Public Records Unit, (909) 396-3700, Tuesday through Friday, 7:00 a.m. to 5:30 p.m. Our Fax number is (909) 396-3330. Our email address is PublicRecordsRequests@aqmd.gov.

Submit Your Public Records Request

Stephen Bartlett

From: WB-RB8-FileReview8 <FileReview8@waterboards.ca.gov>
Sent: Monday, August 21, 2017 3:25 PM
To: Stephen Bartlett
Subject: RE: RWQCB Public Records Requests

8/21/17

Hi Stephen,

I show no records in our site database for 27152 Garbani Road, Menifee, CA 92584. If you have any questions you can call me at 951 782 4499.

Thanks,
Mary

From: Stephen Bartlett [mailto:sbartlett@hillmanngroup.com]
Sent: Friday, August 18, 2017 1:25 PM
To: WB-RB8-FileReview8 <FileReview8@waterboards.ca.gov>
Subject: RWQCB Public Records Requests

Good afternoon,

Please see attached public records requests.

Stephen Bartlett
Environmental Technician

Hillmann Consulting, LLC
1745 W. Orangewood Ave., Suite 110
Orange, CA 92868
Office: (714) 634-9500
Cell: (714) 949-2371
Fax: (714) 634-9507

sbartlett@hillmanngroup.com
www.HillmannConsulting.com

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HILLMANN
CONSULTING

August 18, 2017

State of California
Regional Water Quality Control Board – Santa Ana Region (8)
3737 Main Street, Suite #500
Riverside, CA 92501-3339
Phone (951) 782-4130
Fax (951) 781-6288
FileReview8@waterboards.ca.gov

RE: Environmental Files:

27152 Garbani Road,
Menifee, CA 92584

Dear RWQCB:

Hillmann Consulting, LLC is conducting an environmental investigation of the above referenced property. Under the Freedom of Information Act, we are requesting any information your office has regarding this property. If any records are located, we would like to obtain copies or schedule a file review. If no records are available, please contact me to confirm. Thank you.

Sincerely,

Kristine Savona
Office Manager
Hillmann Consulting, LLC
ksavona@hillmanngroup.com

HILLMANN
CONSULTING

August 18, 2017

Riverside County Department of Environmental Health
Hazardous Materials Division
4065 County Circle Drive
Riverside, CA 92513-7600
Phone (951) 358-5055
Fax (951) 358-5017
emvargas@rivco.org

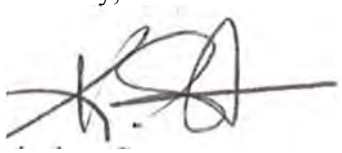
RE: Underground Storage Tank/Hazardous Materials Files:

27152 Garbani Road, Vacant Land, Unassigned Address:
APNs: 360300002, 03. 04, 05, 06, 09
Menifee, CA 92584

Dear Sir/Madam:

Hillmann Consulting, LLC is conducting an environmental investigation of the above referenced property. Under the Freedom of Information Act, we are requesting any information your office has regarding this property. If any records are located, we would like to obtain copies or schedule a file review. If no records are available, please contact me to confirm. Thank you.

Sincerely,



Kristine Savona
Office Manager
Hillmann Consulting, LLC
ksavona@hillmanngroup.com

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Barbara A. Lee, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

August 25, 2017

Ms. Kristine Savona
Hillmann Consulting
1745 West Orangewood Avenue, Suite 110
Orange, California 92868

27152 Garbani Road, Vacant Land, Unassigned Address: APNs: 360300002, 03, 04, 05, 096, 09, Menifee, CA 92584
PR 1-081817-11

Dear Ms. Savona:

We have received your Public Records Act Request for records from the Department of Toxic Substances Control.

After a thorough review of our files we have found that no such records exist at this office pertaining to the sites/facilities referenced above.

We would like to inform you about Envirostor, a database that provides information and documents on over 5,000 DTSC cleanup sites. EnviroStor can be accessed at: http://www.envirostor.dtsc.ca.gov/public. Also, a computer is available in the Central Files of each DTSC Regional Office for use by community members to view EnviroStor.

If you have any questions, would like further information regarding your request or would like an appointment to visit Sacramento's Central Files, please contact me at (916) 255-3705.

Sincerely,

Jan Papararo
Regional Records Coordinator

Printed on Recycled Paper

Request Confirmation

Request Information

Tracking Number : *EPA-R9-2017-010642*

Requester Name : Ms. Kristine Savona

Date Submitted : 08/18/2017

Request Status : Submitted

Description :

27152 Garbani Road, Vacant Land: Unassigned Address: APNs: 360300002, 03, 04, 05, 06, 09 Menifee, 92584 Dear Sir/Madam: We would like to request any information your office has regarding any environmental documents, underground storage tanks (USTs) or hazardous materials for the property listed below. If any records are located, we would like to obtain copies or schedule a file review. If no records are available, please contact me to confirm. Thank you for your assistance.

HILLMANN
CONSULTING

August 18, 2017

State of California
Department of Toxic Substances Control
Region 4 – Cypress Regional Office
5796 Corporate Avenue
Cypress, CA 90630-4732
Phone (714) 484-5337
Fax (714) 484-5318
PubReqAct@dtsc.ca.gov

RE: DTSC Files:

27152 Garbani Road, Vacant Land, Unassigned Address:
APNs: 360300002, 03, 04, 05, 06, 09
Menifee, CA 92584

Dear Sir/Madam:

Hillmann Consulting, LLC is conducting an environmental investigation of the above referenced property. Under the Freedom of Information Act, we are requesting any information your office has regarding this property. If any records are located, we would like to obtain copies or schedule a file review. If no records are available, please contact me to confirm. Thank you.

Sincerely,

Kristine Savona
Office Manager
Hillmann Consulting, LLC
ksavona@hillmanngroup.com

A & R Laboratories

Formerly Microbac Southern California

1650 S. GROVE AVE., SUITE C
ONTARIO, CA 91761
951-779-0310 FAX 951-779-0344
www.arlaboratories.com office@arlaboratories.com

FDA#	2030513
LA City#	10261
ELAP#'s	2789
	2790
	2122

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CASE NARRATIVE

Authorized Signature Name / Title (print)	Ken Zheng, President
Signature / Date	Ken Zheng, President 08/25/2017 10:12:25
Laboratory Job No. (Certificate of Analysis No.)	1708-00173
Project Name / No.	MENIFEE SOIL SAMPLING C3-6927
Dates Sampled (from/to)	08/21/17 To 08/21/17
Dates Received (from/to)	08/21/17 To 08/21/17
Dates Reported (from/to)	08/25/17 To 8/25/2017
Chains of Custody Received	Yes

Comments:

Subcontracting

Organic Analyses

No analyses sub-contracted

Inorganic Analyses

No analyses sub-contracted

Sample Condition(s)

All samples intact

Positive Results (Organic Compounds)

None

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 001 **B-1**
Sample Matrix: **Soil**
Date & Time Sampled: 08/21/17 @ 9:00

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	70		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	65		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**108**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**24.6**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.66**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**12.3**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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CERTIFICATE OF ANALYSIS

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 001 **B-1**
Sample Matrix: **Soil**
Date & Time Sampled: 08/21/17 @ 9:00

.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Lead	**2.56**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**6.27**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**27.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**43.2**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 **B-1**					Date & Time Sampled:		08/21/17 @ 9:00	
Sample Matrix: **Soil**								
.....continued								
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	80		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	75		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 002 **B-2**					Date & Time Sampled:		08/21/17 @ 9:05	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	72		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	71		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 002 **B-2** Date & Time Sampled: 08/21/17 @ 9:05
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	**1.93**		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**120**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**29.7**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**10.4**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**15.6**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**1.92**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**7.75**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**39.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**41.3**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 002 **B-2**					Date & Time Sampled:		08/21/17 @ 9:05	
Sample Matrix: **Soil**								
.....continued								
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	82		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	78		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 003 **B-3**					Date & Time Sampled:		08/21/17 @ 9:10	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 003 **B-3**					Date & Time Sampled:		08/21/17 @ 9:10	
Sample Matrix: **Soil**								
.....continued								
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	76		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	72		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	**1.82**		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**105**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**30.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**8.13**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**6.57**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**1.06**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**7.22**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**30.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**26.5**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 003 **B-3**					Date & Time Sampled:		08/21/17 @ 9:10	
Sample Matrix: **Soil**								
.....continued								
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	79		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	82		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 004 **B-4**					Date & Time Sampled:		08/21/17 @ 9:15	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 004 **B-4**					Date & Time Sampled:		08/21/17 @ 9:15	
Sample Matrix: **Soil**								
.....continued								
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	75		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	70		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**58.9**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**16.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**5.01**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**3.23**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**0.732**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**3.14**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**18.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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1708-00173

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 004 **B-4**					Date & Time Sampled:		08/21/17 @ 9:15	
Sample Matrix: **Soil**								
.....continued								
Zinc	**21.1**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	82		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	81		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 005 **B-5**					Date & Time Sampled:		08/21/17 @ 9:45	
Sample Matrix: **Soil**								

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 005 **B-5**					Date & Time Sampled:		08/21/17 @ 9:45	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	69		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	70		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	**1.18**		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**116**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**21.9**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.92**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**11.9**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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1708-00173

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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 005 **B-5** Date & Time Sampled: 08/21/17 @ 9:45
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Lead	**0.683**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**5.71**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**27.7**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**29.7**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 005 **B-5**					Date & Time Sampled:		08/21/17 @ 9:45	
Sample Matrix: **Soil**								
.....continued								
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	78		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	75		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 006 **B-6**					Date & Time Sampled:		08/21/17 @ 9:55	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	70		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	72		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB

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Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 006 **B-6** Date & Time Sampled: 08/21/17 @ 9:55
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**87.8**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**26.7**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.91**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**36.8**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**3.14**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**5.65**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**44.7**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**42.0**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 006 **B-6**					Date & Time Sampled:		08/21/17 @ 9:55	
Sample Matrix: **Soil**								
.....continued								
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	82		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	81		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 007 **B-7**					Date & Time Sampled:		08/21/17 @ 10:05	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 007 **B-7** Date & Time Sampled: 08/21/17 @ 10:05
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	75		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	72		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**86.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**25.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.85**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**15.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**1.81**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.91**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**43.9**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**34.6**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 007 **B-7**					Date & Time Sampled:		08/21/17 @ 10:05	
Sample Matrix: **Soil**								
.....continued								
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	79		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	74		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 008 **B-8**					Date & Time Sampled:		08/21/17 @ 10:30	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
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Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 008 **B-8**					Date & Time Sampled:		08/21/17 @ 10:30	
Sample Matrix: **Soil**								
.....continued								
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	69		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	71		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**111**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**18.5**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.20**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**7.84**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**1.59**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.71**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**25.2**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 008 **B-8**					Date & Time Sampled:		08/21/17 @ 10:30	
Sample Matrix: **Soil**								
.....continued								
Zinc	**37.1**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	75		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	70		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 009 **B-9**					Date & Time Sampled:		08/21/17 @ 10:35	
Sample Matrix: **Soil**								

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 009 **B-9**					Date & Time Sampled:		08/21/17 @ 10:35	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	70		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	72		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**152**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**23.2**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**9.13**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**10.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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1708-00173

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BRANDON CLEMENTS
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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 009 **B-9**					Date & Time Sampled:		08/21/17 @ 10:35	
Sample Matrix: **Soil**								
.....continued								
Lead	**0.922**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**6.13**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**31.5**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**42.1**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 009 **B-9**					Date & Time Sampled:		08/21/17 @ 10:35	
Sample Matrix: **Soil**								
.....continued								
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	72		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	71		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 010 **B-10**					Date & Time Sampled:		08/21/17 @ 10:45	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	75		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	71		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 010 **B-10** Date & Time Sampled: 08/21/17 @ 10:45
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**109**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**17.9**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.26**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**7.67**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.61**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**25.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**34.1**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR

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Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 010 **B-10** Sample Matrix: **Soil**					Date & Time Sampled:		08/21/17 @ 10:45	
.....continued								
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	76		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	71		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 011 **B-11** Sample Matrix: **Soil**					Date & Time Sampled:		08/21/17 @ 11:00	
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 011 **B-11**					Date & Time Sampled:		08/21/17 @ 11:00	
Sample Matrix: **Soil**								
.....continued								
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	72		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	76		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**102**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**17.2**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**6.55**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**6.53**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.17**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**24.4**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**32.0**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 011 **B-11**					Date & Time Sampled:		08/21/17 @ 11:00	
Sample Matrix: **Soil**								
.....continued								
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	80		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	72		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 012 **B-12**					Date & Time Sampled:		08/21/17 @ 11:10	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 012 **B-12** Date & Time Sampled: 08/21/17 @ 11:10
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	68		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	70		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	**1.17**		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**99.8**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**23.4**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.09**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**179**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**2.92**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**8.52**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**23.9**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 012 **B-12**					Date & Time Sampled:		08/21/17 @ 11:10	
Sample Matrix: **Soil**								
.....continued								
Zinc	**37.3**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	76		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	70		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 013 **B-13**					Date & Time Sampled:		08/21/17 @ 11:20	
Sample Matrix: **Soil**								

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Customer P.O.	C3-6927

Sample: 013 **B-13**
Sample Matrix: **Soil**
Date & Time Sampled: 08/21/17 @ 11:20

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	72		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	75		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**92.4**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**22.9**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.58**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**14.6**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 013 **B-13** Date & Time Sampled: 08/21/17 @ 11:20
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Lead	**2.02**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.83**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**36.7**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**36.4**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 013 **B-13**					Date & Time Sampled:		08/21/17 @ 11:20	
Sample Matrix: **Soil**								
.....continued								
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	75		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	71		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 014 **B-14**					Date & Time Sampled:		08/21/17 @ 11:00	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	62		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	70		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB

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Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 014 **B-14**					Date & Time Sampled:		08/21/17 @ 11:00	
Sample Matrix: **Soil**								
.....continued								
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**81.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**23.5**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.61**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**16.2**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**2.19**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.73**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**40.5**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**35.9**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR

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Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 014 **B-14**					Date & Time Sampled:		08/21/17 @ 11:00	
Sample Matrix: **Soil**								
.....continued								
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	76		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	81		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 015 **B-15**					Date & Time Sampled:		08/21/17 @ 11:40	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 015 **B-15**					Date & Time Sampled:		08/21/17 @ 11:40	
Sample Matrix: **Soil**								
.....continued								
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	75		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	71		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**83.3**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**18.4**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**5.80**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**7.95**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**1.85**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.73**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**21.8**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**30.3**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 015 **B-15**					Date & Time Sampled:		08/21/17 @ 11:40	
Sample Matrix: **Soil**								
.....continued								
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	72		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	68		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 016 **B-16**					Date & Time Sampled:		08/21/17 @ 11:50	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 016 **B-16**					Date & Time Sampled:		08/21/17 @ 11:50	
Sample Matrix: **Soil**								
.....continued								
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	68		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	70		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**93.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**16.8**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**5.79**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**5.41**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**3.57**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.21**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**22.5**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 016 **B-16**					Date & Time Sampled:		08/21/17 @ 11:50	
Sample Matrix: **Soil**								
.....continued								
Zinc	**38.4**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	75		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	72		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 017 **B-17**					Date & Time Sampled:		08/21/17 @ 12:00	
Sample Matrix: **Soil**								

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 017 **B-17**					Date & Time Sampled:		08/21/17 @ 12:00	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	72		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	73		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**110**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**19.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**6.82**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**6.60**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 017 **B-17** Date & Time Sampled: 08/21/17 @ 12:00
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Lead	**5.20**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**5.43**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**24.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**37.7**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 017 **B-17**					Date & Time Sampled:		08/21/17 @ 12:00	
Sample Matrix: **Soil**								
.....continued								
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	69		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	65		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 018 **B-18**					Date & Time Sampled:		08/21/17 @ 12:10	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	68		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	71		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 018 **B-18**					Date & Time Sampled:		08/21/17 @ 12:10	
Sample Matrix: **Soil**								
.....continued								
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**77.8**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**18.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**5.61**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**5.86**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**3.09**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.32**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**26.2**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**34.7**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR

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CERTIFICATE OF ANALYSIS

1708-00173

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BRANDON CLEMENTS
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SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 018 **B-18**					Date & Time Sampled:		08/21/17 @ 12:10	
Sample Matrix: **Soil**								
.....continued								
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	72		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	76		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 019 **B-19**					Date & Time Sampled:		08/21/17 @ 12:20	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 019 **B-19**					Date & Time Sampled:		08/21/17 @ 12:20	
Sample Matrix: **Soil**								
.....continued								
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	70		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	72		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**83.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**19.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**6.78**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**7.35**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**3.22**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.78**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**30.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**36.1**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 019 **B-19**					Date & Time Sampled:		08/21/17 @ 12:20	
Sample Matrix: **Soil**								
.....continued								
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	85		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	81		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 020 **B-20**					Date & Time Sampled:		08/21/17 @ 12:30	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/23/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN

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Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 020 **B-20** Date & Time Sampled: 08/21/17 @ 12:30
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/23/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/23/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	65		%REC	EPA 8270SIM		30-115	08/23/17	JEN
p-Terphenyl-D14	62		%REC	EPA 8270SIM		18-137	08/23/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	**1.06**		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**88.4**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**22.2**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**8.30**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**16.8**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**2.67**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.99**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**40.7**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 020 **B-20**					Date & Time Sampled:		08/21/17 @ 12:30	
Sample Matrix: **Soil**								
.....continued								
Zinc	**44.7**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	79		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	82		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 021 **B-21**					Date & Time Sampled:		08/21/17 @ 12:30	
Sample Matrix: **Soil**								

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 021 **B-21**					Date & Time Sampled:		08/21/17 @ 12:30	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/24/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/24/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	67		%REC	EPA 8270SIM		30-115	08/24/17	JEN
p-Terphenyl-D14	69		%REC	EPA 8270SIM		18-137	08/24/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	**1.78**		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**116**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**20.5**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**8.31**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**9.26**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 021 **B-21**					Date & Time Sampled:		08/21/17 @ 12:30	
Sample Matrix: **Soil**								
.....continued								
Lead	**4.58**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**4.94**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**29.4**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**41.1**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 021 **B-21**					Date & Time Sampled:		08/21/17 @ 12:30	
Sample Matrix: **Soil**								
.....continued								
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	75		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	78		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 022 **B-22**					Date & Time Sampled:		08/21/17 @ 12:40	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/24/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/24/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	75		%REC	EPA 8270SIM		30-115	08/24/17	JEN
p-Terphenyl-D14	71		%REC	EPA 8270SIM		18-137	08/24/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB

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Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 022 **B-22**					Date & Time Sampled:		08/21/17 @ 12:40	
Sample Matrix: **Soil**								
.....continued								
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	**2.81**		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**92.6**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**30.6**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**10.3**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**67.5**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**1.98**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**10.9**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**35.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**46.8**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR

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Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 022 **B-22**					Date & Time Sampled:		08/21/17 @ 12:40	
Sample Matrix: **Soil**								
.....continued								
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	80		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	76		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 023 **B-23**					Date & Time Sampled:		08/21/17 @ 12:50	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/24/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 023 **B-23**					Date & Time Sampled:		08/21/17 @ 12:50	
Sample Matrix: **Soil**								
.....continued								
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/24/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	69		%REC	EPA 8270SIM		30-115	08/24/17	JEN
p-Terphenyl-D14	70		%REC	EPA 8270SIM		18-137	08/24/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**78.2**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**23.8**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.10**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**11.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**4.04**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**5.44**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**40.3**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Zinc	**36.0**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 023 **B-23**					Date & Time Sampled:		08/21/17 @ 12:50	
Sample Matrix: **Soil**								
.....continued								
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	81		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	82		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Sample: 024 **B-24**					Date & Time Sampled:		08/21/17 @ 13:00	
Sample Matrix: **Soil**								
[PAHs by GCMS]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/24/17	JEN
Acenaphthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Acenaphthylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(a)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(a)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(b)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 024 **B-24** Date & Time Sampled: 08/21/17 @ 13:00
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Benzo(g,h,i)perylene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Benzo(k)fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Chrysene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Dibenzo(a,h)anthracene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Fluoranthene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Fluorene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Indeno(1,2,3-c,d)pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
2-Methylnaphthalene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Naphthalene	<0.015		mg/kg	EPA 8270SIM	1.0	0.015	08/24/17	JEN
Phenanthrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
Pyrene	<0.010		mg/kg	EPA 8270SIM	1.0	0.010	08/24/17	JEN
[Semi-Volatile Surrogates]								
2-Fluorobiphenyl	72		%REC	EPA 8270SIM		30-115	08/24/17	JEN
p-Terphenyl-D14	75		%REC	EPA 8270SIM		18-137	08/24/17	JEN
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		08/24/17	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Barium	**92.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Chromium	**23.1**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Cobalt	**7.74**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Copper	**12.0**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Lead	**3.76**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Nickel	**5.82**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1.0	1.00	08/24/17	TLB
Vanadium	**36.4**		mg/Kg	EPA 6010B	1.0	0.500	08/24/17	TLB

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CERTIFICATE OF ANALYSIS

1708-00173

HILLMANN CONSULTING
BRANDON CLEMENTS
1745 W ORANGEWOOD AVE
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ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	08/25/17
Date Received	08/21/17
Invoice No.	80282
Cust #	H080
Permit Number	
Customer P.O.	C3-6927

Sample: 024 **B-24** Date & Time Sampled: 08/21/17 @ 13:00
Sample Matrix: **Soil**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Zinc	**39.0**		mg/Kg	EPA 6010B	1.0	5.00	08/24/17	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1.0		08/23/17	VS
Mercury	<0.20		mg/Kg	EPA 7471A	1.0	0.20	08/23/17	VS
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		08/22/17	VS
Aldrin	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
alpha-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
beta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
delta-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
gamma-BHC	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
4,4'-DDD	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDE	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
4,4'-DDT	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Dieldrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan I	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Endosulfan II	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endosulfan Sulfate	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin Aldehyde	<0.0020		mg/Kg	EPA 8081A	1.0	0.0020	08/22/17	AR
Endrin ketone	<0.100		mg/Kg	EPA 8081A	1.0	0.100	08/22/17	AR
Heptachlor	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Heptachlor Epoxide	<0.0010		mg/Kg	EPA 8081A	1.0	0.0010	08/22/17	AR
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	08/22/17	AR
Toxaphene	<0.020		mg/Kg	EPA 8081A	1.0	0.020	08/22/17	AR
[Surrogates]								
Tetrachloro-m-xylene	78		%REC	EPA 8081A/8082		50-150	08/22/17	AR
Decachlorobiphenyl	81		%REC	EPA 8081A/8082		50-150	08/22/17	AR

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Respectfully Submitted: Ken Zheng

Ken Zheng - Lab Director

QUALIFIERS

B = Detected in the associated Method Blank at a concentration above the routine RL.
B1 = BOD dilution water is over specifications . The reported result may be biased high.
D = Surrogate recoveries are not calculated due to sample dilution.
E = Estimated value; Value exceeds calibration level of instrument.
H = Analyte was prepared and/or analyzed outside of the analytical method holding time
I = Matrix Interference.
J = Analyte concentration detected between RL and MDL.
Q = One or more quality control criteria did not meet specifications. See Comments for further explanation.
S = Customer provided specification limit exceeded.

ABBREVIATIONS

DF = Dilution Factor
RL = Reporting Limit, Adjusted by DF
MDL = Method Detection Limit, Adjusted by DF
Qual = Qualifier
Tech = Technician

As regulatory limits change frequently, A & R Laboratories advises the recipient of this report to confirm such limits with the appropriate federal, state, or local authorities before acting in reliance on the regulatory limits provided.

For any feedback concerning our services, please contact Jenny Jiang, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at office@arlaboratories.com.

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QUALITY CONTROL DATA REPORT

1708-00173

HILLMANN GROUP
GREG SHAFFER
1745 W. ORANGEWOOD AVE.
SUITE 110
ORANGE, CA 92868

Project: MENIFEE SOIL SAMPLING

Date Reported	**08/25/2017**
Date Received	**08/21/2017**
Date Sampled	**08/21/2017**
Invoice No.	**80282**
Customer #	**H080**
Customer P.O.	**C3-6927**

Method # EPA 6010B
QC Reference # 67028 **Date Analyzed:** 8/24/2017 **Technician:** TLB
Samples 001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018

Results

	LCS %REC	LCS %DUP	LCS %RPD	SPIKE %REC	SPIKE %DUP	SPIKE %RPD
Antimony	97	108	11.0	105	104	1.3
Arsenic	94	96	1.9	107	107	0.2
Barium	97	97	0.2	88	89	0.3
Beryllium	89	87	2.1	84	83	1.0
Cadmium	96	97	1.1	92	92	0.5
Chromium	98	98	0.2	90	89	0.5
Cobalt	94	94	0.3	98	97	0.5
Copper	92	92	0.7	103	101	1.5
Lead	95	95	0.4	89	88	0.7
Molybdenum	91	92	1.4	90	89	0.4
Nickel	94	95	0.8	93	93	0.2
Selenium	95	92	2.5	88	89	1.0
Silver	103	102	0.5	98	98	0.4
Thallium	90	96	6.5	116	117	1.3
Vanadium	94	94	0.6	84	82	1.1
Zinc	94	95	0.9	84	84	0.2

Control Ranges

LCS %REC	LCS %RPD	SPIKE %RPD
75 - 125	0 - 20	0 - 20

QC Reference # 67067 **Date Analyzed:** 8/24/2017 **Technician:** TLB
Samples 019 020 021 022 023 024

Results

	LCS %REC	LCS %DUP	LCS %RPD	SPIKE %REC	SPIKE %DUP	SPIKE %RPD
Antimony	110	115	5.3	115	112	2.1
Arsenic	97	101	4.2	96	96	0.0
Barium	98	98	0.3	92	89	1.3
Beryllium	99	98	0.3	99	98	1.1
Cadmium	97	98	0.5	93	93	0.4
Chromium	98	98	0.2	93	91	1.3
Cobalt	97	97	0.2	101	101	0.2
Copper	97	98	0.8	106	105	0.5
Lead	96	98	1.8	92	92	0.7
Molybdenum	99	100	0.8	98	96	1.2
Nickel	96	97	0.9	96	95	1.1
Selenium	98	102	3.9	96	94	1.7
Silver	104	103	0.5	97	96	1.2
Thallium	104	101	3.1	106	103	2.6
Vanadium	98	98	0.0	92	90	1.0
Zinc	97	97	0.4	89	88	0.5

Control Ranges

LCS %REC	LCS %RPD	SPIKE %RPD
75 - 125	0 - 20	0 - 20

Method # EPA 7471A
QC Reference # 67056 **Date Analyzed:** 8/23/2017 **Technician:** VS
Samples 001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020

Results

	LCS %REC	SPIKE %REC	SPIKE %DUP	SPIKE %RPD
Mercury	95	80	85	6

Control Ranges

LCS %REC	SPIKE %RPD
75 - 125	0 - 25

A & R Laboratories

Formerly Microbac Southern California

1650 S. GROVE AVE., SUITE C
ONTARIO, CA 91761
951-779-0310 FAX 951-779-0344
www.arlaboratories.com office@arlaboratories.com

FDA#	2030513
LA City#	10261
ELAP#'s	2789
	2790
	2122

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QUALITY CONTROL DATA REPORT

1708-00173

HILLMANN GROUP
GREG SHAFFER

Date Reported 08/25/2017
Date Received 08/21/2017
Date Sampled 08/21/2017

Project: MENIFEE SOIL SAMPLING

Method # EPA 7471A
QC Reference # 67057 **Date Analyzed:** 8/23/2017 **Technician:** VS
Samples 021 022 023 024

Results

	LCS %REC	LCS %DUP	LCS %RPD
Mercury	91	95	4

Control Ranges

LCS %REC	LCS %RPD
75 - 125	0 - 25

Method # EPA 8081A
QC Reference # 67047 **Date Analyzed:** 8/22/2017 **Technician:** AR
Samples 001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020

Results

	LCS %REC	SPIKE %REC	SPIKE %DUP	SPIKE %RPD
4,4'-DDT	95	83	78	6
Aldrin	90	81	82	2
Dieldrin	90	85	79	7
Endrin	92	78	86	9
gamma-BHC	92	80	81	2
Heptachlor	90	76	82	7

Control Ranges

LCS %REC	SPIKE %RPD
70 - 130	0 - 25
70 - 130	0 - 25
70 - 130	0 - 25
70 - 130	0 - 25
70 - 130	0 - 25
70 - 130	0 - 25

QC Reference # 67051 **Date Analyzed:** 8/22/2017 **Technician:** AR
Samples 021 022 023 024

Results

	LCS %REC	LCS %DUP	LCS %RPD
4,4'-DDT	78	86	9
Aldrin	85	85	0
Dieldrin	76	80	5
Endrin	82	78	5
gamma-BHC	81	81	0
Heptachlor	83	86	4

Control Ranges

LCS %REC	LCS %RPD
70 - 130	0 - 25
70 - 130	0 - 25
70 - 130	0 - 25
70 - 130	0 - 25
70 - 130	0 - 25
70 - 130	0 - 25

Method # EPA 8081A/8082
QC Reference # 67047 **Date Analyzed:** 8/22/2017 **Technician:** AR
Samples 001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020

No QC recoveries reported.

QC Reference # 67051 **Date Analyzed:** 8/22/2017 **Technician:** AR
Samples 021 022 023 024

No QC recoveries reported.

Method # EPA 8270SIM
QC Reference # 67054 **Date Analyzed:** 8/23/2017 **Technician:** JEN
Samples 001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020

Results

	LCS %REC	LCS %DUP	LCS %RPD	SPIKE %REC	SPIKE %DUP	SPIKE %RPD
Acenaphthene	89	85	5	86	85	2
Pyrene	81	81	0	87	81	7

Control Ranges

LCS %REC	LCS %RPD	SPIKE %RPD
40 - 110	0 - 25	0 - 25
35 - 140	0 - 25	0 - 25

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	2790
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QUALITY CONTROL DATA REPORT

1708-00173

HILLMANN GROUP
GREG SHAFFER

Date Reported 08/25/2017
Date Received 08/21/2017
Date Sampled 08/21/2017

Project: MENIFEE SOIL SAMPLING

Method # EPA 8270SIM
QC Reference # 67055 **Date Analyzed:** 8/24/2017 **Technician:** JEN
Samples 021 022 023 024

Results

	LCS %REC	LCS %DUP	LCS %RPD
Acenaphthene	87	81	7
Pyrene	80	85	6

Control Ranges

LCS %REC	LCS %RPD
40 - 110	0 - 25
35 - 140	0 - 25

No method blank results were above reporting limit

Respectfully Submitted: Ken Zheng

Ken Zheng - President

For any feedback concerning our services, please contact Jenny Jiang, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at office@arlaboratories.com.

AR LABORATORIES, Inc.

Chain of Custody Record

AR Lab Job # 1708-00173

1650 S. Grove Ave Suite C
Ontario, CA 91761
Voice: 951.779.0310 ● 800.798.9336
Fax: 951.779.0344

www.arlaboratories.com info@arlaboratories.com

Project No:	Project Name:
C3-6927	Menifee Soil Sampling

Project Manager:	Phone:	Fax:
Ryan Terwilliger	559-905-6744	

Client Name:	Address:
(Report and Billing) Hillmann Consulting	(Report and Billing) 1745 W. Orangewood Avenue, Suite 110 Orange, California 92868

Please Circle Analyses Requested

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	Polycyclic Aromatic Hydrocarbons	Metals: Title 22 (CAM), RCRA, PP	8081A (Organochlorine Pesticides)	Remarks/Special Instructions
1	B-1	8/21	9:00	soil	North side	1 glass	X	X	X	
2	B-2		9:05		↓					
3	B-3		9:10		↓					
4	B-4		9:15		East side					
5	B-5		9:25		↓					
6	B-6		9:55		north central					
7	B-7		10:05		↓					
8	B-8		10:30		West side					
9	B-9		10:35		↓					
10	B-10	↓	10:45	↓	↓	↓	↓	↓	↓	

Turn-Around Time

- ☐ 24 Hr. RUSH*
- ☐ 48 Hr. RUSH*
- ☒ Normal TAT

*Requires PRIOR approval, additional charges apply

Requested due date: _____

1) Relinquished by: (Sampler's Signature)	Date:	Time:	3) Relinquished by:	Date:	Time:
Steven Bueltte	8/21/17	2:30			
2) Received by:	Date:	Time:	4) Received by:	Date:	Time:
			5) Relinquished by:	Date:	Time:
			6) Received for Laboratory by:	Date:	Time:
				8/21/17	2:30

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

To be completed by Laboratory personnel: 2.8°C

Samples chilled? ☒ Yes ☐ No ☐ From Field

Custody seals? ☐ Yes ☒ No

All sample containers intact? ☒ Yes ☐ No

☐ Courier ☐ UPS/Fed Ex ☒ Hand carried

Sample Disposal

- ☐ Client will pick up
- ☐ Return to client
- ☒ Lab disposal

Laboratory Notes:

Sample Locator No.

White Copy - Original (Accompanies Samples) Yellow Copy - Centrum Files Pink Copy - Centrum duplicate

AR LABORATORIES, Inc.

Chain of Custody Record

AR Lab Job # 1708-00173

1650 S. Grove Ave Suite C
Ontario, CA 91761
Voice: 951.779.0310 ● 800.798.9336
Fax: 951.779.0344

www.arlaboratories.com info@arlaboratories.com

Project No:	Project Name:
C3-6927	Menifee Soil Sampling

Project Manager:	Phone:	Fax:
Ryan Terwilliger	559-905-6744	

Client Name: (Report and Billing)	Address: (Report and Billing)
Hillmann Consulting	1745 W. Orangewood Avenue, Suite 110 Orange, California 92868

Please Circle Analyses Requested

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	Polycyclic Aromatic Hydrocarbons	Metals: Title 22 (CAM), RCRA, PP	8081A (Organochlorine Pesticides)	Remarks/Special Instructions
11	B-11	8/21	11:00	Soil	Central	glass	X	X	X	
12	B-12		11:10							
13	B-13		11:20							
14	B-14		11:30							
15	B-15		11:40		East side					
16	B-16		11:50		West side					
17	B-17		12:00		West side					
18	B-18		12:10		South west					
19	B-19		12:20							
20	B-20		12:30							

Turn-Around Time

- ☐ 24 Hr. RUSH*
- ☐ 48 Hr. RUSH*
- ☑ Normal TAT

*Requires PRIOR approval, additional charges apply

Requested due date: _____

1) Relinquished by: (Sampler's Signature)	Date:	Time:	3) Relinquished by:	Date:	Time:
Stephen Bartlett	8/21/17	2:30			
2) Received by:	Date:	Time:	4) Received by:	Date:	Time:
The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.			5) Relinquished by:	Date:	Time:
			6) Received for Laboratory by:	Date: 8/21/17	Time: 2:30p

To be completed by Laboratory personnel: 2.8°C

Samples chilled? ☑ Yes ☐ No ☐ From Field

Custody seals? ☐ Yes ☑ No

All sample containers intact? ☑ Yes ☐ No

☐ Courier ☐ UPS/Fed Ex ☒ Hand carried

Sample Disposal

- ☐ Client will pick up
- ☐ Return to client
- ☑ Lab disposal

Laboratory Notes:

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www.arlaboratories.com info@arlaboratories.com

Project No:	Project Name:
C3-6927	Menifee Soil Sampling

Project Manager:	Phone:	Fax:
Ryan Terwilliger	559-905-6744	

Client Name:	Address:
(Report and Billing) Hillmann Consulting	(Report and Billing) 1745 W. Orangewood Avenue, Suite 110 Orange, California 92868

Please Circle Analyses Requested

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	Polycyclic Aromatic Hydrocarbons	Metals: Title 22 (CAM), RCRA, PP	8081A (Organochlorine Pesticides)	Remarks/Special Instructions
21	B-21	8/21/17	12:30	Soil	South east corner	1 glass	X	X	X	
22	B-22		12:40							
23	B-23		12:50							
24	B-24		1:00							

Turn-Around Time

- ☐ 24 Hr. RUSH*
- ☐ 48 Hr. RUSH*
- ☒ Normal TAT

*Requires PRIOR approval, additional charges apply

Requested due date: _____

1) Relinquished by: (Sampler's Signature)	Date:	Time:	3) Relinquished by:	Date:	Time:
Stephen Bartlett	8/21/17	2:30			
2) Received by:	Date:	Time:	4) Received by:	Date:	Time:
			5) Relinquished by:	Date:	Time:
			6) Received for Laboratory by:	Date:	Time:
				8/21/17	2:30

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

To be completed by Laboratory personnel: 2.8°C

Samples chilled? ☒ Yes ☐ No ☐ From Field

Custody seals? ☐ Yes ☒ No

All sample containers intact? ☒ Yes ☐ No

☐ Courier ☐ UPS/Fed Ex ☒ Hand carried

Sample Disposal

- ☐ Client will pick up
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- ☒ Lab disposal

Laboratory Notes:

Sample Locator No.

White Copy - Original (Accompanies Samples) Yellow Copy - Centrum Files Pink Copy - Centrum duplicate

ARL

Sample Acceptance Checklist

CLIENT: Hillmann Consulting WORK ORDER NUMBER: 1708-00173

Temperature:(Criteria:0.0°C-6.0°C)

Sample Temp.(w/CF) °C(w/CF) 2.8°C

☐ Sample(s) outside temprature criteria: PM contacted by :

☐ Sample(s) outside temprature criteria, but received on ice/chilled on same day of sampling.

☐ Sample(s) received at ambient temprature; placed on ice for transport by courier.

Ambient Temprature ☐ Air ☐ Filter

CUSTODY SEAL:

Cooler	☐	Present and Intact	☐	Present and Not Intact	☑	Not Present
Sample(s)	☐	Present and Intact	☐	Present and Not Intact	☑	Not Present

Sample Condition:	Yes	No	N/A
Was a COC received	✓		
Were sample IDs present?	✓		
Were sampling dates & times present?	✓		
Was a relingquished signature present?	✓		
Were the tests required clearly indicated?	✓		
Were all samples sealed in plastic bags?	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were correct containers used for the tests required?	✓		
Was a sufficient amount of samples sent for tests indicated?	✓		
Was there headspace in VOA vials?			✓
Were the containers labeled with correct preservatives?			✓

Explanations/Comments:

Notification:

For discrepancies, how was the Project Manager notified? Verbal

Verbal: PM Initials: _____ Data/Time: _____

Email: Send to: _____ Data/Time: _____

Project Manager's response:

Completed By: Cynthia Rios Date: 8-21-17

A R Laboratories
1650 S. Grove Ave., Suite C, Ontario, CA 91761
PH: 951-779-0310 Fax: 951-779-0344
Email: office@arlaboratories.com

APPENDIX G

PROJECT PERSONNEL QUALIFICATIONS

HILLMANN
CONSULTING

Christopher Baker, LEED AP

Vice President of Operations

EDUCATION:

B.A. Economics, University of Maryland

CERTIFICATIONS:

LEED Accredited Professional

NIOSH 582 Certified

EPA AHERA Asbestos Inspector/Management Planner Certified

EPA AHERA Project Designer/Supervisor Certified

State of VA Licensed Asbestos Inspector/Management Planner

State of VA Licensed Asbestos Project Monitor

AIHA Asbestos Analyst Registry Board Approved ID# 4593

EPA Trained in IAQ Evaluation and Remediation

Radiation Safety Trained

Scitec XRF Operator's License

Trained/certified in accordance with 29 CFR 1910.146 permit-required confined spaces.

YEARS OF EXPERIENCE:

With Hillmann: 27 years

Total: 27 years

PROFESSIONAL EXPERIENCE:

Mr. Baker is the Vice President of Operations at Hillmann, responsible for business operations, fiscal management and field staff management throughout the company. Mr. Baker is responsible for the performance and management of industrial hygiene services, IAQ Investigations, Mold & Moisture Investigations, Asbestos and Lead Paint Investigations on 20,000,000+ square feet in commercial, office, retail, government, school and multi-family residential settings. He responds and coordinates restoration response following disasters, fires, pipe breaks, etc. Mr. Baker is an ASTM Qualified Environmental Professional for the performance of Phase I and Phase II Environmental Site Assessments. He writes remedial specifications and Operation & Maintenance (O&M) Programs for commercial and residential buildings and co-wrote Standard Operating Procedure for heavy construction contractors working in naturally occurring asbestos.

He also acts as a primary point of contact for multiple high-profile, nationwide clients and is frequently requested to help solve difficult situations and regulatory issues.

As a LEED AP, Mr. Baker provides green building services toward LEED accreditation in the Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality and Innovation & Design categories. He prepares sustainable strategies to enhance indoor environments including moisture management, hazardous materials compliance, indoor air quality management, pollutant source control and ventilation effectiveness. Mr. Baker also implements systems maintenance practices, water conservation programs and energy efficient building operation plans to reduce environmental impacts.

Representative experience includes:

Tishman Speyer Properties, Various locations nationwide: Hillmann has been providing the complete environmental program for Tishman Speyer's properties since 1987. Our services include phase I environmental site assessments, subsurface investigations, site remediation oversight, asbestos surveys, air monitoring, bid administration, O&M programs, employee training, industrial hygiene and indoor air quality programs. The estimated contract value is $1,000,000 annually. Mr. Baker functions as a Project Principal, Project Manager and Environmental Assessor. This project is ongoing.

Citigroup – Complete Environmental Program, Various locations nationwide: Mr. Baker is the Project Principal, Project Manager and Environmental Assessor for this contract on which Hillmann has been providing complete environmental program including Phase I environmental site assessments, Phase II environmental site assessments, asbestos and lead surveys, air monitoring, bid administration and O&M programs, industrial hygiene and indoor air quality programs, geology services, radon testing and hazardous materials assessments. Estimated cost to date: $8,250,000. This project is ongoing.

J.C. Penney Company, Inc., Various locations nationwide: Since 1994, Hillmann has been providing complete environmental consulting for J.C. Penney including: Phase I & II ESA's, IAQ, Mold, Asbestos, Lead, Water testing, from identification through testing through remediation. Mr. Baker's role included Project Manager and Environmental Assessor responsibilities. Estimated cost to date: $4,000,000. This project is ongoing.

Verizon Environmental Services, Various locations nationwide: Since 1996, Hillmann has been providing Verizon with asbestos and lead investigations, abatement design, air monitoring and mold and water sampling and emergency response services including IAQ, noise, confined space, characterization, and ventilation evaluation. Mr. Baker functions as Project Manager on this contract. Estimated cost to date: $12,600,000. This project is ongoing.

Mill Creek Realty Trust, Various nationwide locations: Mr. Baker is the Project Principal and Project Manager for this Client since 2002 as Hillmann provides expertise and guidance on moisture intrusion and microbial issues encountered during construction projects and within their occupied multi-family residential buildings. Assisted in the development of MCRT's moisture protection program, conduct pro-active inspections, conduct incident response investigations and oversee restoration. Additionally conduct hazardous material inspections for demolition purposes. Cost $500,000 to date. These projects are ongoing.

General Growth Properties, Various nationwide facilities: National service agreement for phase I site assessments and hazardous materials surveys, including asbestos surveys and investigations, project monitoring, mold work, bulk sampling and analysis. Mr. Baker is the Project Principal and Project Manager on the contract. This project is ongoing. Cost: $750,000.

Wexford Development, LLC, Various locations nationwide: Hillmann provides complete environmental consulting for this client including Phase I & II ESA's, UST removal, IAQ, mold, asbestos, lead, and water testing. Mr. Baker functions as a Project Principal, Project Manager and Environmental Assessor in its execution. Cost: $254,000. This project is ongoing.

Clark Construction, Various locations Metro Washington DC: Mr. Baker is the Project Principal and Project Manager for this Client as Hillmann provides expertise and guidance on moisture intrusion and microbial issues encountered during construction projects. Assisted in the development of Clark's moisture protection program, conduct pro-active inspections, conduct employee training, conduct incident response investigations and oversee restoration. Cost $150,000 to date. These projects are ongoing.

Tyson's Corner Center, McLean, VA: Hillmann is providing asbestos and lead surveys and remediation oversight, UST services, IAQ and mold services, and Phase I environmental site assessments for this ongoing contract. Mr. Baker functions as the Project Principal, Project Manager and Field Technician. Cost: $600,000. This project is

ongoing.

Diocese of Arlington, Fairfax & Arlington Counties, VA: Mr. Baker is the Project Principal and Project Manager overseeing asbestos, IAQ, lead and mold consulting services. Over 250 projects have been completed in 53 different buildings. The Diocese is a continuous client since 1989. Cost: $500,000

Fairfax County Public Schools, Fairfax County, VA: As Project Principal and Project Manager for this contract, Mr. Baker provided oversight and management for this asbestos, lead and mold consulting as well as various Indoor Air Quality projects. A total of 236 projects were completed in over 50 different school/center/office buildings without incident. Cost: $125,000 annually.

St. Anselm's Abbey and School, Washington, DC: Mr. Baker is responsible for Project Management and Field Technician Services on this ongoing asbestos and lead investigation contract, and 3 year AHERA re-inspections. Cost: $15,000.

Tishman Speyer Properties: Subsurface Investigation and Soil Segregation on a City Block, Washington, DC: Hillmann was retained to perform subsurface investigations and soil segregation on a city block slated for construction. Several Phase II subsurface investigations were conducted on the site to determine environmental impacts to soil and groundwater. Subsurface investigations were conducted with both direct push and hollow stem auger technology. Analytical results indicated soil and groundwater contamination from metals and PAH compounds. Hillmann performed the process of advancing borings within the footprint of the planned excavation to pre-classify soils for regulatory disposal. Our team was then responsible for complete oversight of the segregation and disposal of impacted soil. Based on semi-volatile compounds identified in the soil from past use, Hillmann designed an injection program whereby a reagent was introduced into the excavation footprint. The injection program was 100% successful in removing all compounds above regulatory criteria. Metals were successfully removed and all residual PAH compounds remediated with a no further action letter received from the regulating agency. Mr. Baker serves as Project Principal, Project Manager and Environmental Assessor for this project, which completed in 2009. Cost $147,000.

July 12, 2021
Project Number: 01217205.00

Mr. Luis Magallon
City of Menifee
29714 Haun Road
Menifee, California 92586

Subject: **Third Party Report Review of Phase I Environmental Site Assessment (Review)**
City of Menifee Tract # 31174, PLN21-0199

Site: **Golden Meadows Project**
Assessor's Parcel Numbers (APNs) 360300002, -03, -04, -05, -06, -09, 360350001
Northwest of the Intersection of Wickerd Road and Ascot Way, Menifee California 92584

Dear Mr. Magallon:

Pursuant to your request and authorization, SCS Engineers (SCS) has reviewed[1] a City of Menifee (Client)-provided document in connection with the above-referenced Site. SCS performed the Review to assess whether the report and underlying work are generally consistent with the ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E 1527-13 (Standard) and our experience. The work described in this Review was performed by SCS in general accordance with the City of Menifee Professional Services Agreement, FY2021/2022 On-Call Engineering Services (Contract) between SCS and the Client, which is valid from July 2, 2021 through June 30, 2022.

Should you have any questions regarding this Review, please do not hesitate to call the undersigned at (858) 571-5500.

Sincerely,

Luke Montague, MESM, PG 8071
Vice President
SCS ENGINEERS

1 This Review was general in nature and not intended to address a detailed assessment of consistency with applicable regulatory standards.

1. BACKGROUND

Based on the Client's request and authorization, SCS has completed a Review of the following Client-provided report:

- *Phase I Environmental Site Assessment, Golden Meadows Tract 31174, Menifee, California 92584,* prepared by Hillman Consulting (Hillman) and dated August 31, 2017 for Richland Communities

The above-referenced Phase I Environmental Site Assessment report (Phase I ESA) indicates that the site is comprised of seven parcels of vacant and hilly agricultural land comprising approximately 206.8 acres, located to the northwest of the intersection of Wickerd Road and Ascot Way and to the southeast of the intersection of Garbani Road and Daniel Road in Menifee, California (Site). Historically from approximately 1938 to 2002, Hillman reported that according to a review of historical aerial photographs and other historical records sources, the Site consisted largely of agricultural land with what appears to have been a small development related to agricultural purposes on the west portion of the Site. Since at least 2005, the Site is reported to have been vacant land.

In order to assess the potential for elevated pesticide levels of the Site due to historic use as agricultural land, Hillman reported that in 2017 they collected twenty-four (24) soil samples and analyzed them for organochlorine pesticides (OCPs), Title 22 metals, and polycyclic aromatic hydrocarbons (PAHs). The results were reported to be below the detection levels for all OCPs and PAHs analyzed. Low concentration of various metals were detected, however these were all well below the California Human Health Screening Levels (CHHSLs) as set by the DTSC. Due to these results, Hillman reported that the historic use of the Site as agricultural land is not considered to be a Recognized Environmental Condition. Note that a Phase II Environmental Site Assessment report that would include a summary of means and methods of the activities completed, locations with a map of the collected soil samples, with tabulated laboratory analytical results and with the laboratory results appended was not included in the Phase I ESA that was provided to SCS; therefore, this Review is limited to the provided Phase I ESA only.

REVIEW OF BIOSOLIDS/SLUDGE MAPS

In order to assess whether the Site is recorded as a biosolids/sludge application property, SCS reviewed the map titled "Permitted Biosolids/Sludge Application Map," prepared by the City of Menifee and un-dated. Based upon a review of the map, the Site is not shown as an area where Composite Fields were present. Note that Composite Fields do appear to have been located on the property situated adjacent to the east of the Site, situated to the northeast of the intersection of Wickerd Road and Ascot Way.

2. PHASE I ENVIRONMENTAL SITE ASSESSMENT REVIEW

2.1 PHASE I ESA REQUIREMENTS

The following table summarizes various requirements of the Standard and if they were addressed as part of the above-referenced Phase I ESA. Please note that the table below does not include all requirements of the Standard.

Requirement	Addressed
User Requirements	
Review of title and judicial records for environmental liens or activity use limitations	Yes
Specialized knowledge or experience of the user	Yes
Purchase price compared to property value	Yes
Commonly known or reasonably ascertainable information	Yes
Obvious indications that point to the presence of contamination	Yes
Site Reconnaissance	
Site building description	Yes
Site grounds description	Yes
Hazardous materials and petroleum product use and storage (type, quantity, storage conditions)	Yes
Hazardous waste generation (type, quantity, storage conditions)	Yes
Indications of releases	Yes
PCB-containing equipment	Yes
Fuel source for heating and cooling	Yes
Electricity and natural gas supplier	Yes
Potable water supplier	Yes
Sewer conveyance	Yes
Records Review	
Building department records review	No*
Department of environmental health review	Yes
Other supplemental records sources requests	Yes
Interviews	
Interviews with current owner	Yes
Interview with current occupant	Yes
Interview with previous owners	Yes
Interview with previous occupants	Yes
Physical Setting	
Topographic map review	Yes
Geology	Yes
Depth and flow direction of groundwater	Yes
Off-Site Source Survey	
Regulatory database review	Yes
Discussion and conclusions for facilities identified on the regulatory database	Yes
Regulatory file review for off-Site sources	Yes
Historical Site and Site Vicinity Land Use Review	
Aerial photograph review	Yes
Sanborn fire insurance map review	Yes
City directory review	Yes
Historical resources reviewed back to when the Site was undeveloped or to 1940	Yes
Discussion of gaps of unconfirmed historical Site land use	Yes
Discussion of historical Site and Site vicinity land use	Yes
Data Gaps	
Discussion of Data Gaps	Yes

Requirement	Addressed
Conclusions and Recommendations	
Conclusion consistent with Standard	Yes
Environmental professional signature	Yes
Report	
Within shelf-life	No*
Reliance provided to The City of Menifee	No*

Notes:
* See Additional Discussion section below

2.2 PHASE I ESA REPORT ADDITIONAL DISCUSSION

SCS identified the following items in the Phase I ESA that are interpreted to either be either inconsistent with the Standard or our experience, or to warrant further discussion.

Records Review

No building department records were reported to have been requested for review in the Phase I ESA. Per the above-referenced Standard, building department records are a standard record source that "shall be checked when, in the judgment of the environmental professional, such additional records (1) are reasonably ascertainable, (2) are sufficiently useful, accurate, and complete in light of the objective of the records review (see 8.1.1), and (3) are generally obtained, pursuant to local good commercial and customary practice, in initial environmental site assessments in the type of commercial real estate transaction involved." Although building department records do not appear to have been requested for the Site, the Site was not reported by Hillman to have an address associated with the Site parcels. Since Hillman did review other various standard record sources that SCS judges would have been sufficiently useful if available, and based on the availability of other relevant information, SCS does not consider the lack of building department records request to be a significant data gap. Therefore, the lack of a request for building permit records is not considered by SCS to represent a recognized environmental condition.

Report Date Exceeds Shelf-Life

The date of the Phase I ESA is August 31, 2017. According to the Standard, an environmental site assessment meeting or exceeding this practice and completed less than 180 days prior to the date of acquisition of the property or (for transactions not involving an acquisition) the date of the intended transaction is presumed to be valid. Therefore, since the Phase I ESA was completed almost four years ago, the Phase I ESA is no longer valid per the Standard, and a current investigation of conditions at the Site and Site vicinity likely to affect whether recognized environmental conditions are present at the Site is recommended to be completed. SCS recommends that a new Phase I Environmental Site Assessment be completed for the Site due to the age of the provided Phase I ESA.

Reliance

The Phase I ESA report was prepared by Hillman for Richland Communities, the User of the Phase I ESA. No reliance of the Phase I ESA was provided to the City of Menifee.

SCS recommends that if the City of Menifee acts in a capacity as a relying party for the Site (i.e., as a lender extending credit to be secured by the Site, any purchaser, transferee or assignee, of a mortgage loan [or any portion thereof]), that the City of Menifee consider requesting a reliance letter from Hillman as a relying party for the Phase I ESA for the Site.

3. RECOMMENDATIONS

Based on a review of the Phase I ESA report, SCS recommends that the City of Menifee not approve the Phase I ESA report for the Site with the following rationale:

Report Date Exceeds Shelf-Life

- The date of the Phase I ESA is August 31, 2017. According to the Standard, an environmental site assessment meeting or exceeding this practice and completed less than 180 days prior to the date of acquisition of the property or (for transactions not involving an acquisition) the date of the intended transaction is presumed to be valid. Therefore, since the Phase I ESA was completed almost four years ago, the Phase I ESA is no longer valid per the Standard, and a current investigation of conditions at the Site and Site vicinity likely to affect whether recognized environmental conditions are present at the Site is recommended to be completed. SCS recommends that a new Phase I Environmental Site Assessment be completed for the Site due to the age of the provided Phase I ESA.

The below additional recommendation is provided at the discretion of the City of Menifee:

- SCS recommends that if the City of Menifee acts in a capacity as a relying party for the Site (i.e., as a lender extending credit to be secured by the Site, any purchaser, transferee or assignee, of a mortgage loan [or any portion thereof]), that the City of Menifee consider requesting a reliance letter from Hillman as a relying party for the Phase I ESA report for the Site.

APPENDIX D

HISTORICAL RECORDS DOCUMENTATION

NW of Wicker R and Ascot Way

NW of Wicker R and Ascot Way

Menifee, CA 92584

Inquiry Number: 6595663.8

July 28, 2021

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

07/28/21

Site Name:

NW of Wicker R and Ascot Wa
NW of Wicker R and Ascot Wa
Menifee, CA 92584
EDR Inquiry # 6595663.8

Client Name:

Hillmann Environmental Co.
1745 W Orangewood Avenue
Orange, CA 92868-0000
Contact: Shilpa Sunil

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2016	1"=625'	Flight Year: 2016	USDA/NAIP
2012	1"=625'	Flight Year: 2012	USDA/NAIP
2009	1"=625'	Flight Year: 2009	USDA/NAIP
2006	1"=625'	Flight Year: 2006	USDA/NAIP
2002	1"=625'	Acquisition Date: January 01, 2002	USGS/DOQQ
1996	1"=625'	Acquisition Date: September 30, 1996	USGS/DOQQ
1994	1"=625'	Flight Date: June 01, 1994	USGS
1989	1"=625'	Flight Date: August 15, 1989	USDA
1985	1"=625'	Flight Date: July 28, 1985	USDA
1978	1"=625'	Flight Date: September 20, 1978	USDA
1967	1"=625'	Flight Date: May 15, 1967	USDA
1961	1"=625'	Flight Date: June 14, 1961	USDA
1953	1"=625'	Flight Date: August 28, 1953	USDA
1949	1"=625'	Flight Date: May 08, 1949	USDA
1938	1"=625'	Flight Date: June 14, 1938	USDA

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INQUIRY #: 6595663.8
YEAR: 2016
= 625'
N
EDR

INQUIRY #: 6595663.8
YEAR: 2012
= 625'
N
EDR

INQUIRY #: 6595663.8
YEAR: 2009
= 625'
N
EDR

INQUIRY #: 6595663.8
YEAR: 2006
= 625'
N
EDR

INQUIRY #: 6595663.8
YEAR: 2002
= 625'
N
EDR

INQUIRY #: 6595663.8
YEAR: 1996
= 625'
N
EDR
Subject boundary not shown because it exceeds image extent or image is not georeferenced.

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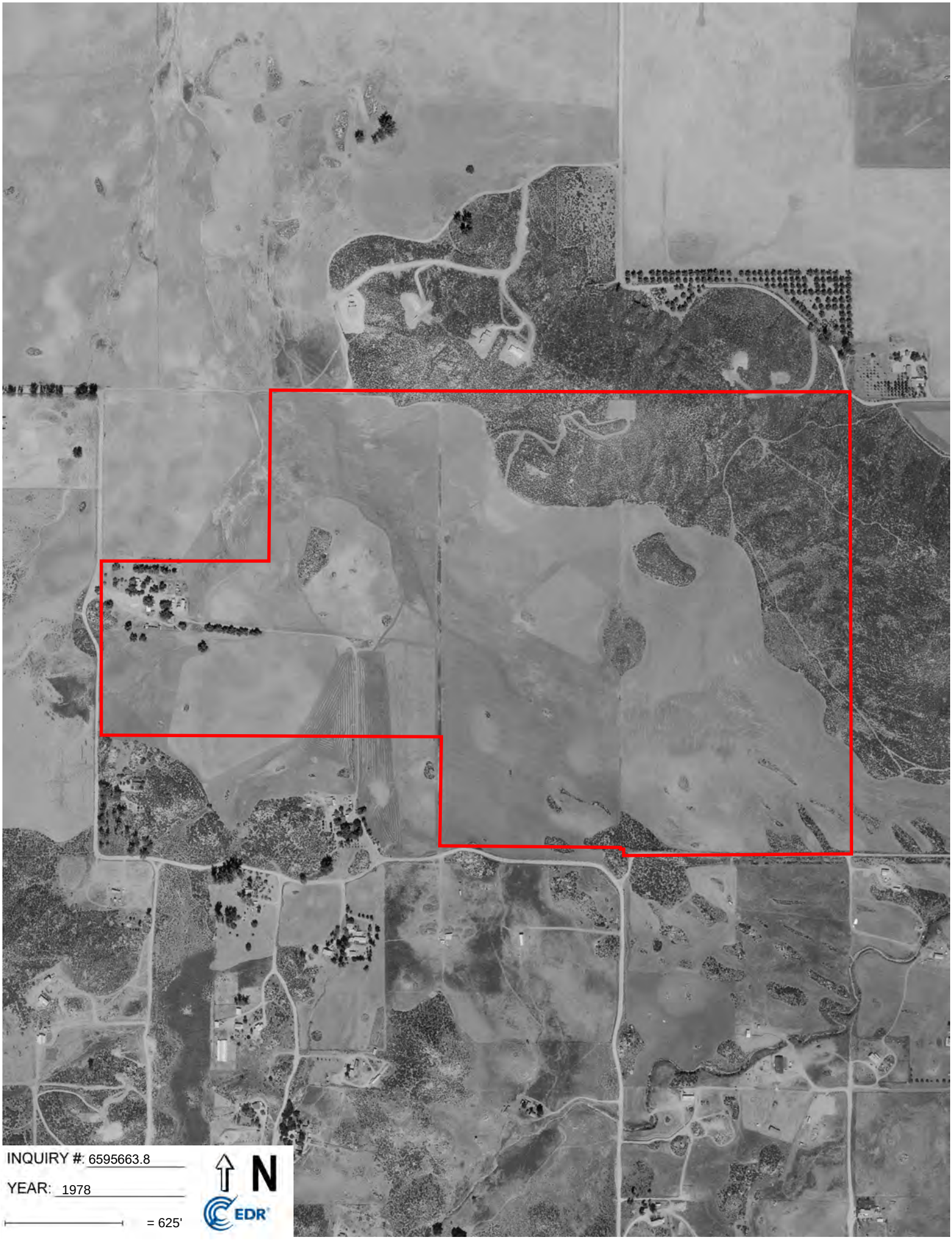
YEAR: 1994
= 625'
N
EDR

INQUIRY #: 6595663.8
YEAR: 1989
= 625'
N
EDR

INQUIRY #: 6595663.8
YEAR: 1985
= 625'
N
EDR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YEAR: 1978
= 625'
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EDR

INQUIRY #: 6595663.8
YEAR: 1967
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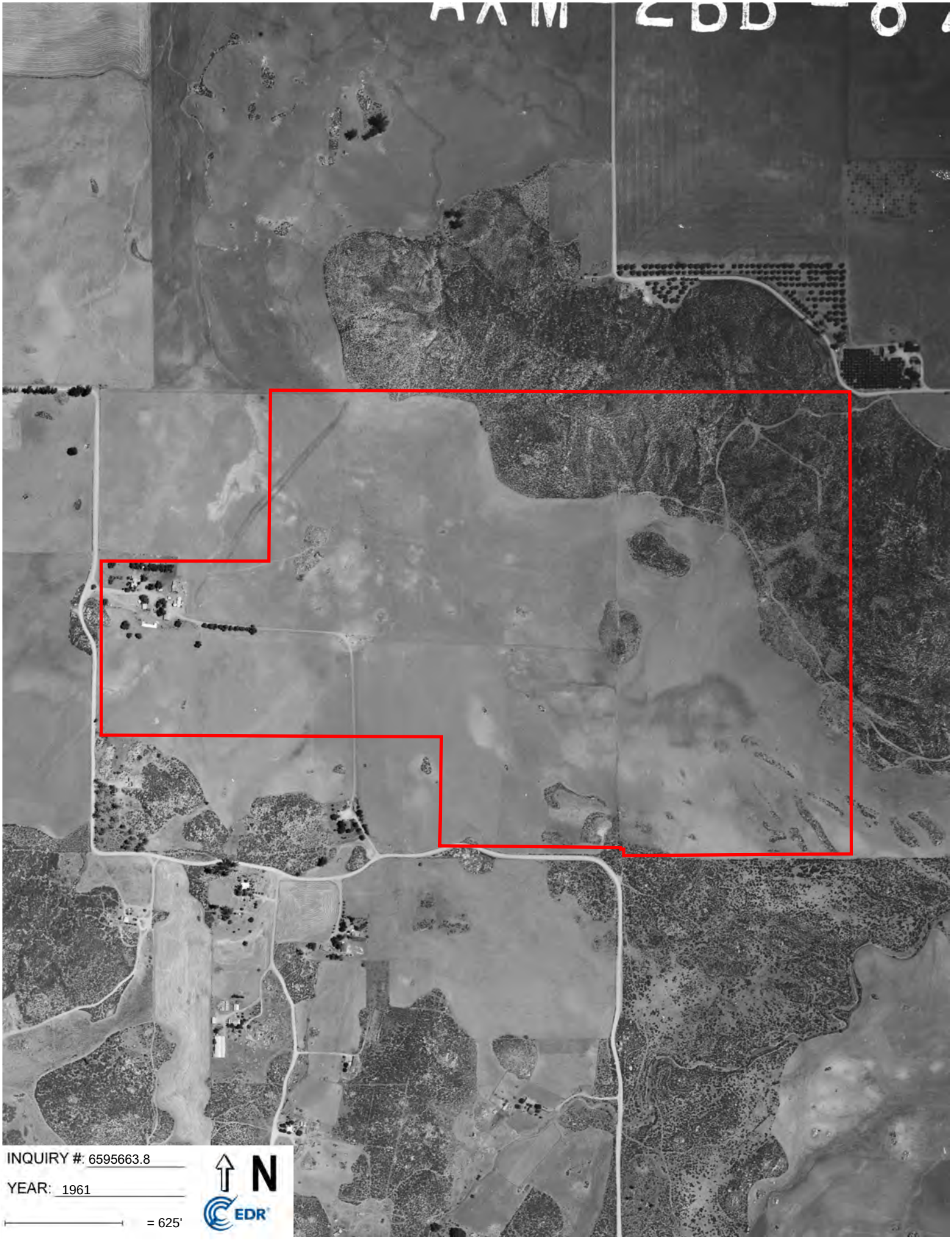
EDR



INQUIRY #: 6595663.8

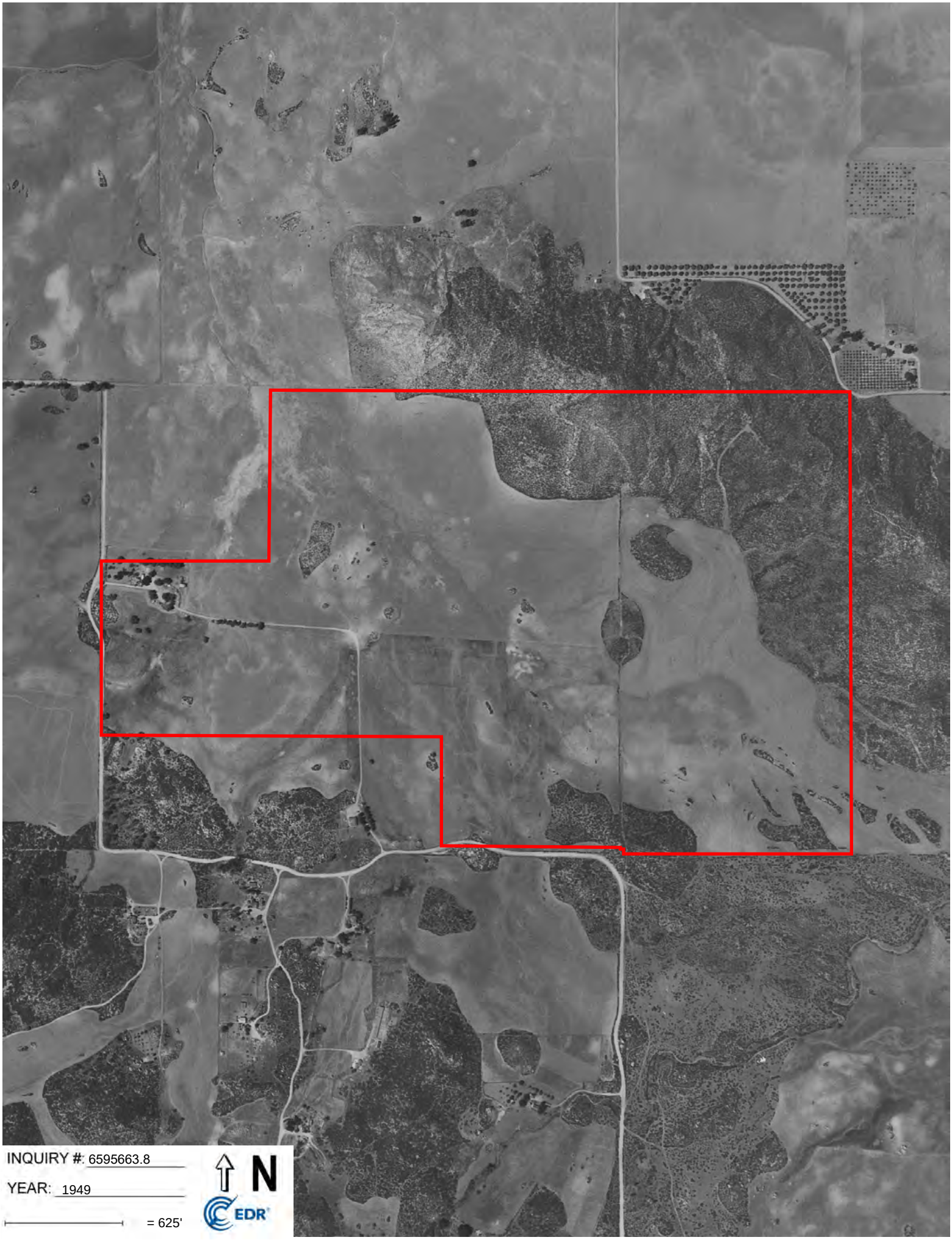
YEAR: 1961

= 625'

N

EDR

INQUIRY #: 6595663.8
YEAR: 1953
= 625'
N
EDR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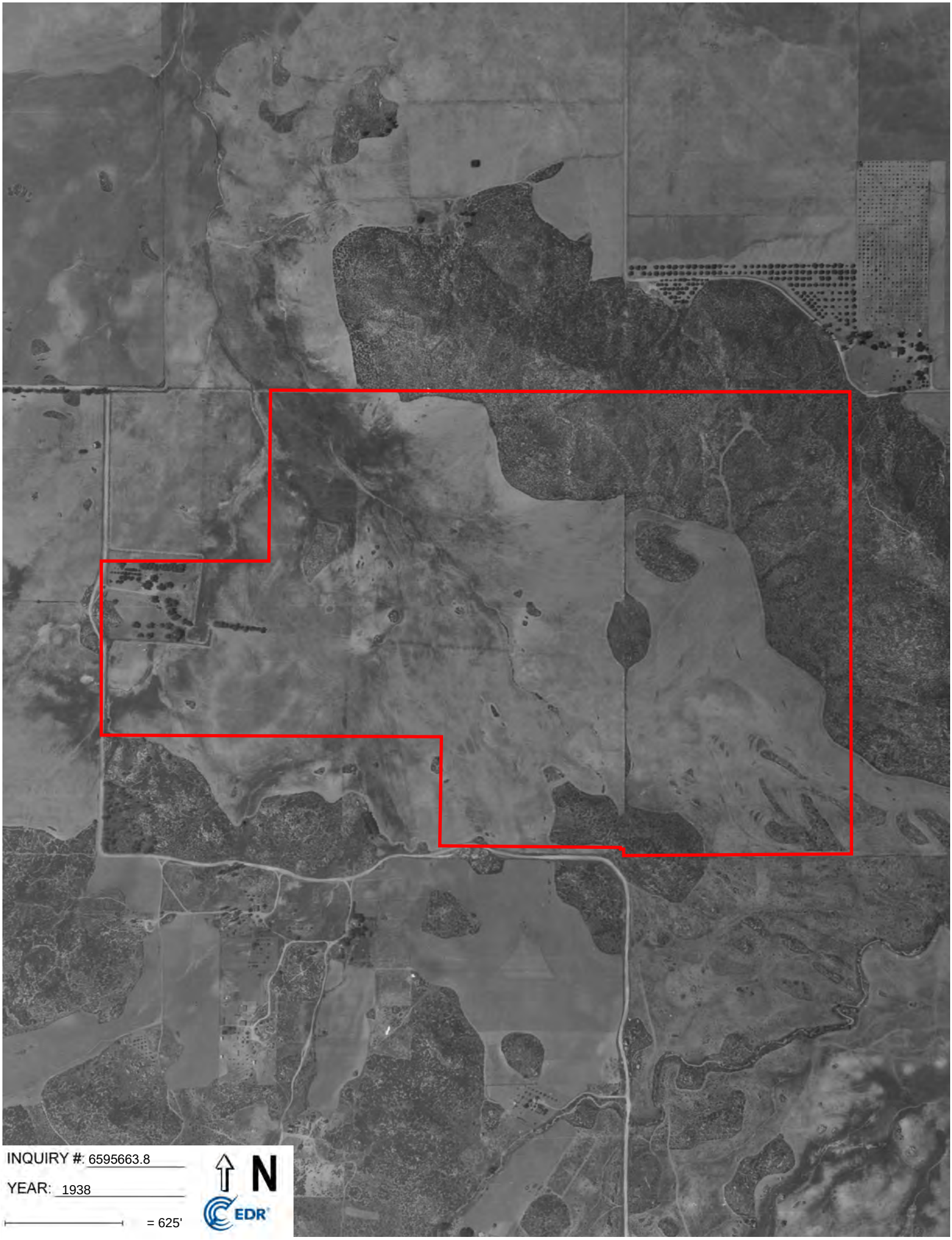
YEAR: 1949
= 625'
N
EDR


INQUIRY #: 6595663.8
YEAR: 1938
= 625'
N
EDR

NW of Wicker R and Ascot Way
NW of Wicker R and Ascot Way
Menifee, CA 92584

Inquiry Number: 6595663.5
July 30, 2021

The EDR-City Directory Image Report

EDR® Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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with any questions or comments.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

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RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2017	☑	☐	EDR Digital Archive
2014	☑	☐	EDR Digital Archive
2010	☑	☐	EDR Digital Archive
2005	☑	☐	EDR Digital Archive
2000	☑	☐	EDR Digital Archive
1995	☑	☐	EDR Digital Archive
1992	☑	☐	EDR Digital Archive
1985	☑	☐	Haines Criss-Cross Directory
1980	☑	☐	Haines Criss-Cross Directory
1976	☐	☐	Haines Criss-Cross Directory
1971	☐	☐	Haines Criss-Cross Directory

FINDINGS

TARGET PROPERTY STREET

NW of Wicker R and Ascot Way
Menifee, CA 92584

Year	*CD Image*	*Source*	
ASCOT WAY			
2017	pg A1	EDR Digital Archive	
2014	pg A3	EDR Digital Archive	
2010	pg A5	EDR Digital Archive	
2005	pg A7	EDR Digital Archive	
2000	pg A9	EDR Digital Archive	
1995	pg A11	EDR Digital Archive	
1992	pg A13	EDR Digital Archive	
1985	pg A15	Haines Criss-Cross Directory	
1980	pg A17	Haines Criss-Cross Directory	
1976	-	Haines Criss-Cross Directory	Street not listed in Source
1971	-	Haines Criss-Cross Directory	Street not listed in Source
WICKER RD			
1985	pg A16	Haines Criss-Cross Directory	
1980	pg A18	Haines Criss-Cross Directory	
1976	-	Haines Criss-Cross Directory	Street not listed in Source
1971	-	Haines Criss-Cross Directory	Street not listed in Source
WICKERD RD			
2017	pg A2	EDR Digital Archive	
2014	pg A4	EDR Digital Archive	
2010	pg A6	EDR Digital Archive	
2005	pg A8	EDR Digital Archive	
2000	pg A10	EDR Digital Archive	
1995	pg A12	EDR Digital Archive	
1992	pg A14	EDR Digital Archive	

FINDINGS

CROSS STREETS

No Cross Streets Identified

City Directory Images

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ASCOT WAY 2017

32293	ARAUZA, JOSE
32530	BIRD, SANDRA M
32535	LEWIS, ROBERT F
32575	JUAREZ, MARIA
32625	GREEK, JACK F
32721	ROLPH, LINDA
32723	FEDUSKA, SEAN
32850	HARO, DARIO R

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

WICKERD RD 2017

25560 BURGESS, BRIAN
25605 NACIF, ALBERTO E
25611 SHIFFLET, STEFANIE J
25625 SLONECKER, RODNEY D
TROTTER, RICHARD R
25925 MALDONADO, JOSE A
26031 HURLEY, DIANA M
26048 FOLEY TRUCKING
FOLEY, JIM
26200 KRUBSACK, ROBERT L
26410 AA LYNCO INC
26501 MACHADO, LESLIE B
26789 SCHAFFER, CHRISTA L
27131 BENDA, RAYMOND H
27145 SPETE, EDDIE F
27171 AVILA, LILIANA E
27269 DANIELS, KELLY M
28900 MARTINEZ, JOSE M
29001 VERSTEGEN, BART
29175 HERRON, KELLEY C
29300 TAM, MAN Y
29612 EZ WAY CONCRETE PUMPING
MILLER, CHARLES F
33680 SHEVITSKI, DEREK L

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ASCOT WAY 2014

32293	CRAWFORD, WAYNE C
32530	BIRD, SANDRA M
32535	LEWIS, ROBERT F
32575	RAMIREZ, GABRIEL
32625	GREEK, TRACEY L
32695	OCCUPANT UNKNOWN,
32721	ROLPH, LINDA
32723	FEDUSKA, TENISHA
32850	HARO, DARIO R
32912	FEDUSKA, DUANE L
32990	DARIOS NURSERY
33883	OCCUPANT UNKNOWN,

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

WICKERD RD 2014

25560 BURGESS, BRIAN
25605 OCCUPANT UNKNOWN,
25611 SHIFFLET, CHARLOTTE J
25625 TROTTER, RICHARD R
25925 OCCUPANT UNKNOWN,
26020 COUNTY OF RIVERSIDE
26031 KING, DONNA
26048 FOLEY TRUCKING
FOLEY, JIM
26200 KRUBSACK, ROBERT L
26410 AA LYNCO INC
SENFTLEBEN, DEAN H
26501 MACHADO, LESLIE B
26789 PYNN, CHRISTA
27131 OCCUPANT UNKNOWN,
27145 SPETE, EDDIE F
27171 DEAVILA, LILIANA
27269 DANIELS, KELLY M
27895 AYALA, SOIL B
27985 SO CAL MULCH INC
28900 HENNINGER, ROSE
29001 VERSTEGEN, BART
29175 HERRON, KELLEY C
29300 TAM, MAN Y
29612 MILLER, CHARLES F
29765 STARNER, CAROL
30125 MADIGAN MOTORSPORTS LLC
32715 OCCUPANT UNKNOWN,
33680 SHEVITSKI, DEREK L

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ASCOT WAY 2010

32293	CRAWFORD, WAYNE C
32530	BIRD, SANDRA M
32535	HAMILTON, THOMAS J
32575	RAMIREZ, GABRIEL
32625	OCCUPANT UNKNOWN,
32695	OCCUPANT UNKNOWN,
32721	SERNA, JOSE J
32723	FEDUSKA, DUANE L
32850	HARO, DARIO
32912	OCCUPANT UNKNOWN,
33883	OCCUPANT UNKNOWN,

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

WICKERD RD 2010

25560 BOUMA, DAN
25605 NACIF, ALBERTO E
25620 KEELEY, GERALD P
25625 SLONECKER, RODNEY D
TROTTER, RICHARD R
26020 RIVERSIDE COUNTY FIRE DEPT
26031 OCCUPANT UNKNOWN,
26048 FOLEY, JIM
26185 OCCUPANT UNKNOWN,
26200 KRUBSACK, ROBERT L
26410 AUGUST, THAMES E
26501 MACHADO, LESLIE B
26789 SCHAFFER, JAMES F
27131 FIGGINS, PAUL
27145 SPETE, EDDIE F
27171 AVILA, JAIME R
27269 LEONE, CATHRINE
27379 OCCUPANT UNKNOWN,
27895 AYALA, SOIL B
27985 LOUIES NURSERY INC
SOUTHERN CALIFORNIA MULCH
28900 OCCUPANT UNKNOWN,
29001 VERSTEGEN, BART
29175 VERSTEGEN, ANTONIUS H
29300 HSIAO, SHUCHUNG C
29612 EZ WAY CONCRETE PUMPING SVC
MILLER, CHARLES F
30125 CATHRO, JAY D
PACIFIC STATES ENGINEERING
32715 OCCUPANT UNKNOWN,
33680 SHEVITSKI, DEREK L
247985 SO CAL MULCH INC

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ASCOT WAY 2005

32293 CRAWFORD, WAYNE C
32530 BIRD, SANDRA M
32535 HAMILTON, THOMAS J
32575 RAMIREZ, GEORGE A
32695 OCCUPANT UNKNOWN,
32721 ROBERTS, W
32723 FEDUSKA, JAMES N
32912 OCCUPANT UNKNOWN,

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

WICKERD RD 2005

25560 COOMBS, PHILLIP W
25605 NACIF, ALBERTO
25611 SHIFFLET, TERRY L
25620 D & R CONTRACT SERVICES
KEELEY, GERALD
25625 MARQUES, BRIAN
OCCUPANT UNKNOWN,
SLONECKER, RODNEY D
TROTTER, RICHARD R
25925 OCCUPANT UNKNOWN,
26020 RIVERSIDE COUNTY FIRE DEPT
26031 SANDERS, TRACY L
26048 FOLEY, JIM
26185 OCCUPANT UNKNOWN,
26200 KRUBSACK, KATHRYN M
26410 AUGUST, THAMES E
26501 MACHADO, RICK
26740 OCCUPANT UNKNOWN,
26789 SCHAFFER, JAMES F
WAGON WHEEL RANCH
27131 FIGGINS, PAUL
27145 OCCUPANT UNKNOWN,
27171 AVILA, JAIME R
27269 CARLOS, GLORIA G
GLORIA CARLOS MESSAGE
27379 GRAVETT, DONALD
27895 AYALA, SOIL B
27985 AYALA SOIL BLENDS
PRECISION SOILS & FORREST PRODUCT IN
28900 MARTINEZ, JOSE
29001 VERSTEGEN, BART
29175 OCCUPANT UNKNOWN,
29300 HSIAO, SHUCHUNG C
29612 MILLER, CHARLES F
30125 CATHRO, JAY D
33660 OCCUPANT UNKNOWN,
33680 SHEVITSKI, DEREK L

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ASCOT WAY 2000

32530 BIRD, SANDRA

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

WICKERD RD 2000

25605 HOUSE, LOYD
25611 SHIFFLET, TERRY L
25620 OCCUPANT UNKNOWN,
25625 PERCHES, GILBERT
PIERCE, JACK A
26031 OCCUPANT UNKNOWN,
26185 MCNAIR, W G
26200 KRUBSACK, KATHRYN M
27269 CARLOS-LOWRY, GLORIA
27895 AYALA SOIL BLENDS
27985 QUALITY SHEDS
28900 PRANO, CYNTHIA L
29001 VERSTEGEN, BART
29175 VERSTEGEN, JACOBUS
29300 HSIAO, SHU C
29612 MILLER, CHUCK
30125 CATHRO, JAY

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ASCOT WAY 1995

32293	CRAWFORD, WAYNE
32530	HENDERSON, STANLEY H
32535	TANNER, ROBERT L
32575	OCCUPANT UNKNOWNN
32721	OCCUPANT UNKNOWNN
32723	OCCUPANT UNKNOWNN
32912	DOUGLASYOUNG, JOHN

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

WICKERD RD 1995

25625 PIERCE, JACK A
25925 EGBERT, ROBERT
26200 KRUBSACK, LOUIS E
26501 MACHADO, RICHARD
27145 SPETZ, EDDIE
27985 AVILA, ALFONSO
QUALITY SHEDS
28900 HUEGEL, FAITH
29001 VERSTEGEN, BART
29175 VERSTEGEN, A H
29300 HSIAO, SHU C
29612 MILLER, CHUCK
30125 CATHRO, JAY
33680 SHEVITSKI, DEREK

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ASCOT WAY 1992

32293 CRAWFORD, WAYNE
32721 MILLS, KATHRYN
32912 DOUGLASYOUNG, JOHN

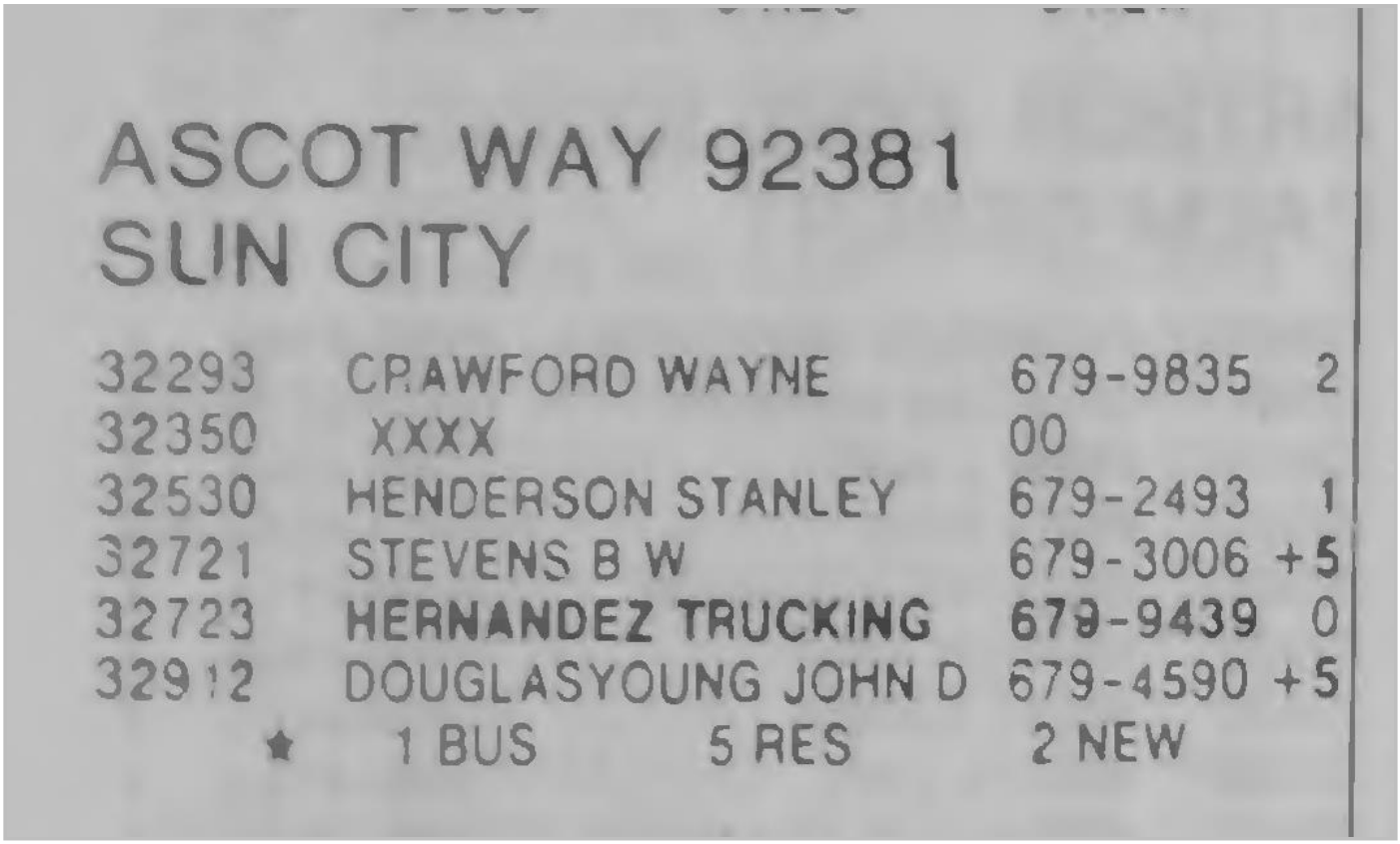
Target Street	Cross Street	Source
✓	-	EDR Digital Archive

WICKERD RD 1992

25611 SHIFFLET, TERRY
25925 EGBERT, ROBERT
26185 VOGSTROM, DICK
27895 AYALA SOIL BENDS
27985 QUALITY SHEDS
28900 HUEGEL, FAITH
29001 VERSTEGEN, BART
30125 FCATHRO, JAY

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

ASCOT WAY 1985



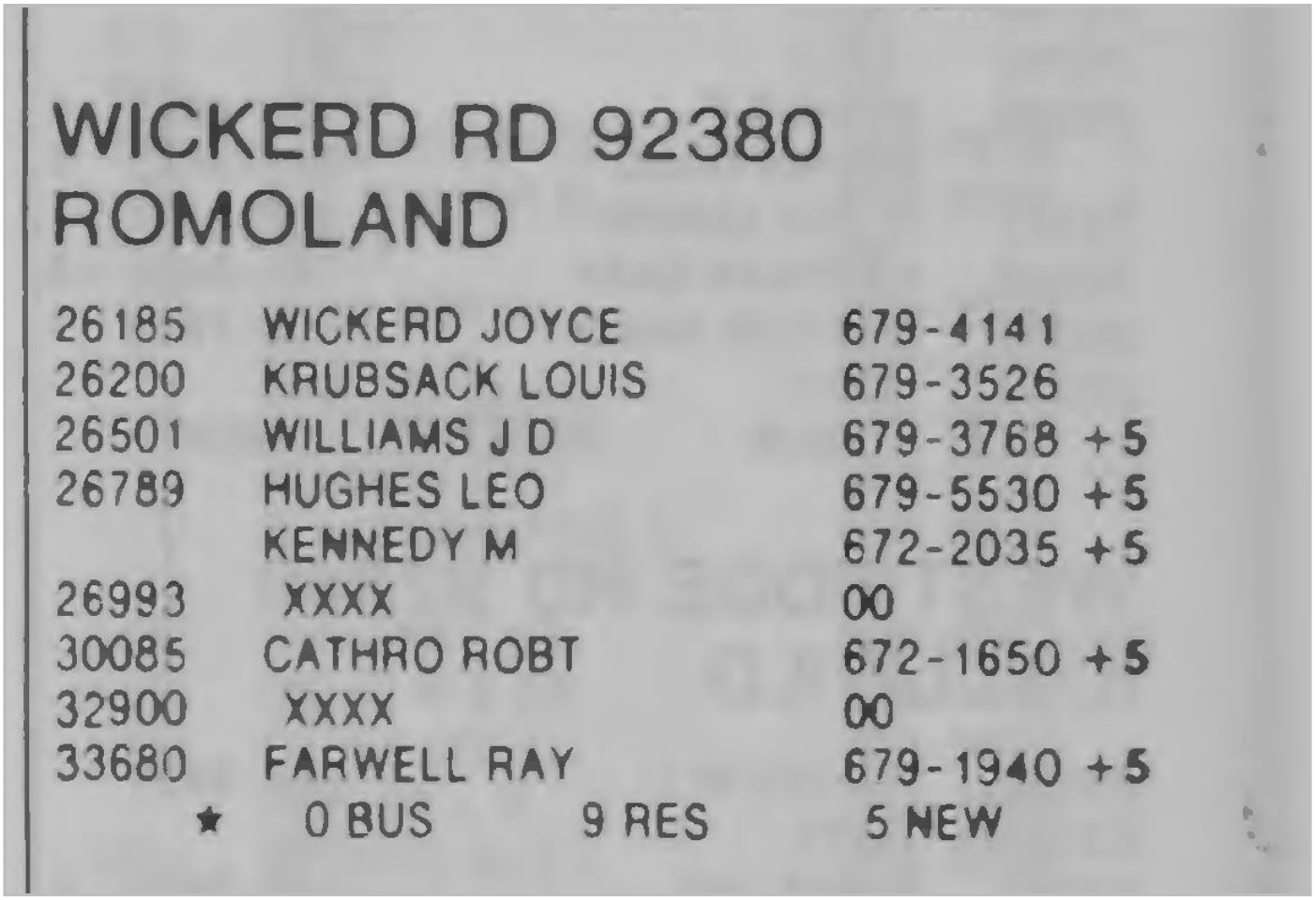
ASCOT WAY 92381
SUN CITY

32293	CRAWFORD WAYNE	679-9835	2
32350	XXXX	00	
32530	HENDERSON STANLEY	679-2493	1
32721	STEVENS B W	679-3006	+5
32723	HERNANDEZ TRUCKING	679-9439	0
32912	DOUGLASYOUNG JOHN D	679-4590	+5

★ 1 BUS 5 RES 2 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

WICKER RD 1985



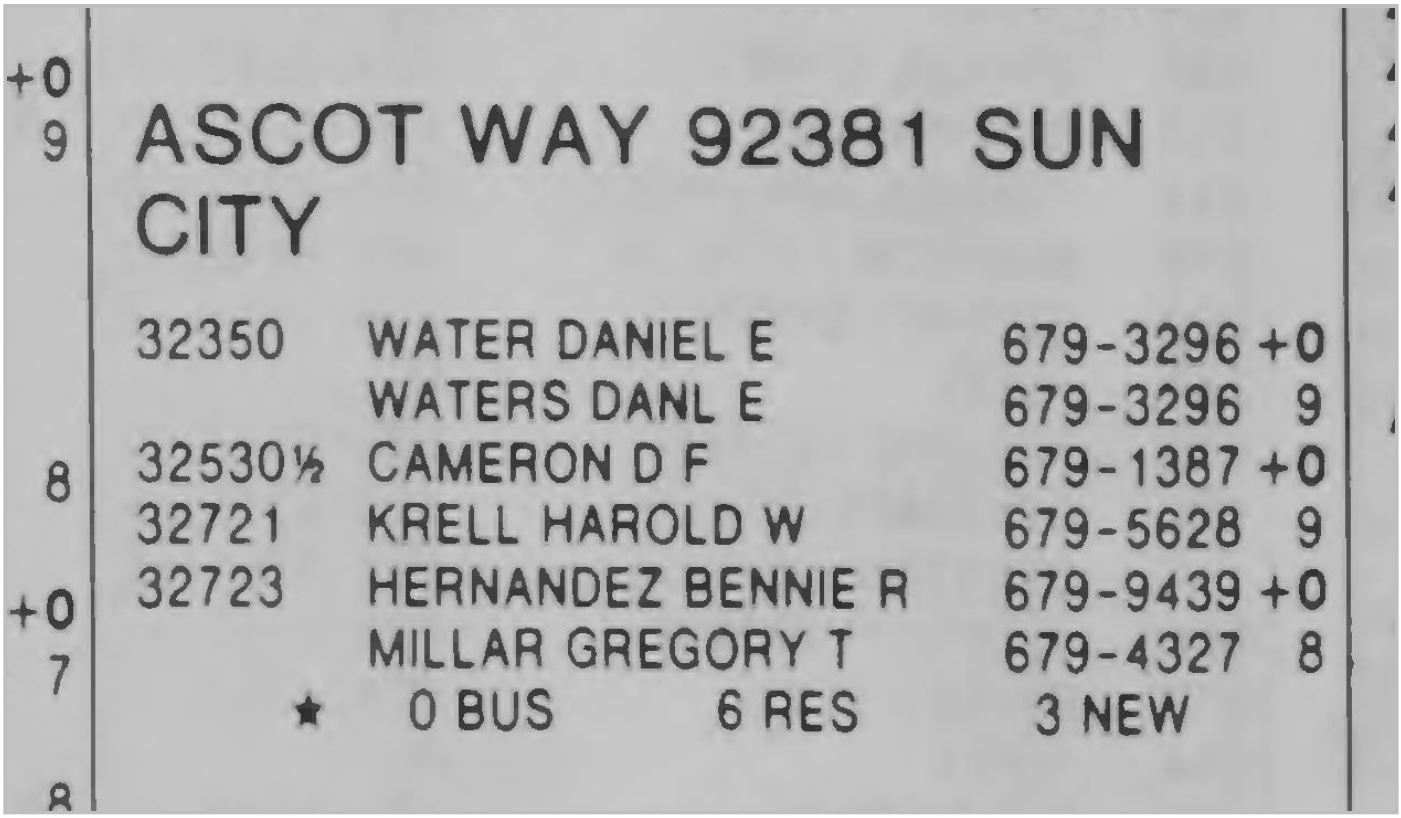
WICKERD RD 92380
ROMOLAND

26185	WICKERD JOYCE	679-4141
26200	KRUBSACK LOUIS	679-3526
26501	WILLIAMS J D	679-3768 +5
26789	HUGHES LEO	679-5530 +5
	KENNEDY M	672-2035 +5
26993	XXXX	00
30085	CATHRO ROBT	672-1650 +5
32900	XXXX	00
33680	FARWELL RAY	679-1940 +5

★ 0 BUS 9 RES 5 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

ASCOT WAY 1980



+0
9

ASCOT WAY 92381 SUN CITY

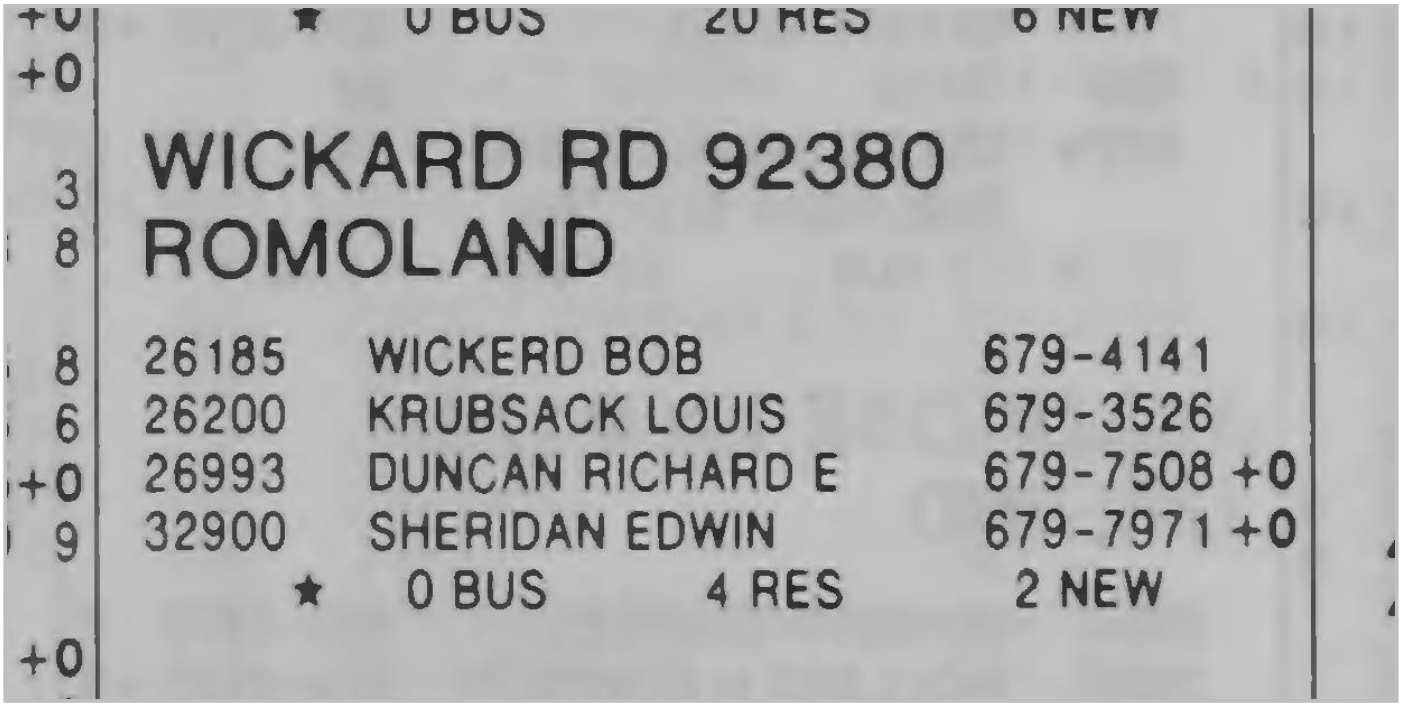
32350	WATER DANIEL E	679-3296 +0
	WATERS DANL E	679-3296 9
8 32530½	CAMERON D F	679-1387 +0
32721	KRELL HAROLD W	679-5628 9
+0 32723	HERNANDEZ BENNIE R	679-9439 +0
7	MILLAR GREGORY T	679-4327 8

★ 0 BUS 6 RES 3 NEW

8

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

WICKER RD 1980



+0 ★ 0 BUS 20 RES 6 NEW

+0

WICKARD RD 92380

3 8 ROMOLAND

8	26185	WICKERD BOB	679-4141	
6	26200	KRUBSACK LOUIS	679-3526	
+0	26993	DUNCAN RICHARD E	679-7508	+0
9	32900	SHERIDAN EDWIN	679-7971	+0

★ 0 BUS 4 RES 2 NEW

+0

NW of Wicker R and Ascot Way

NW of Wicker R and Ascot Way

Menifee, CA 92584

Inquiry Number: 6595663.3

July 28, 2021

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

07/28/21

Site Name:

NW of Wicker R and Ascot Wa
NW of Wicker R and Ascot Wa
Menifee, CA 92584
EDR Inquiry # 6595663.3

Client Name:

Hillmann Environmental Co.
1745 W Orangewood Avenue
Orange, CA 92868-0000
Contact: Shilpa Sunil

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Hillmann Environmental Co. were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # C73B-474B-BCAB

PO # NA

Project C3-8557

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: C73B-474B-BCAB

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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NW of Wicker R and Ascot Way

NW of Wicker R and Ascot Way

Menifee, CA 92584

Inquiry Number: 6595663.4

July 28, 2021

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

07/28/21

Site Name:	Client Name:
NW of Wicker R and Ascot Wa	Hillmann Environmental Co.
NW of Wicker R and Ascot Wa	1745 W Orangewood Avenue
Menifee, CA 92584	Orange, CA 92868-0000
EDR Inquiry # 6595663.4	Contact: Shilpa Sunil

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Hillmann Environmental Co. were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	NA	**Latitude:**	33.652357 33° 39' 8" North
Project:	C3-8557	**Longitude:**	-117.186516 -117° 11' 11" West
		UTM Zone:	Zone 11 North
		UTM X Meters:	482705.79
		UTM Y Meters:	3723626.70
		Elevation:	1558.83' above sea level

Maps Provided:

2012
1979
1973
1953
1947
1943
1942
1901

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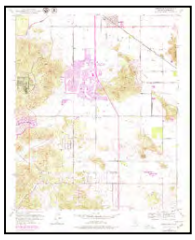
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

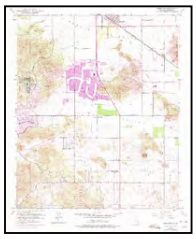
Romoland
2012
7.5-minute, 24000

1979 Source Sheets



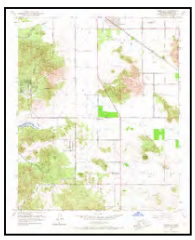
Romoland
1979
7.5-minute, 24000
Aerial Photo Revised 1976

1973 Source Sheets



Romoland
1973
7.5-minute, 24000
Aerial Photo Revised 1973

1953 Source Sheets



Romoland
1953
7.5-minute, 24000
Aerial Photo Revised 1951

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

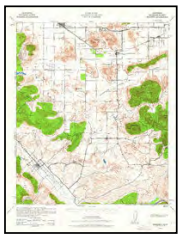
1947 Source Sheets

MURRIETA
1947
15-minute, 50000

1943 Source Sheets

Murrieta
1943
15-minute, 62500
Aerial Photo Revised 1939

1942 Source Sheets



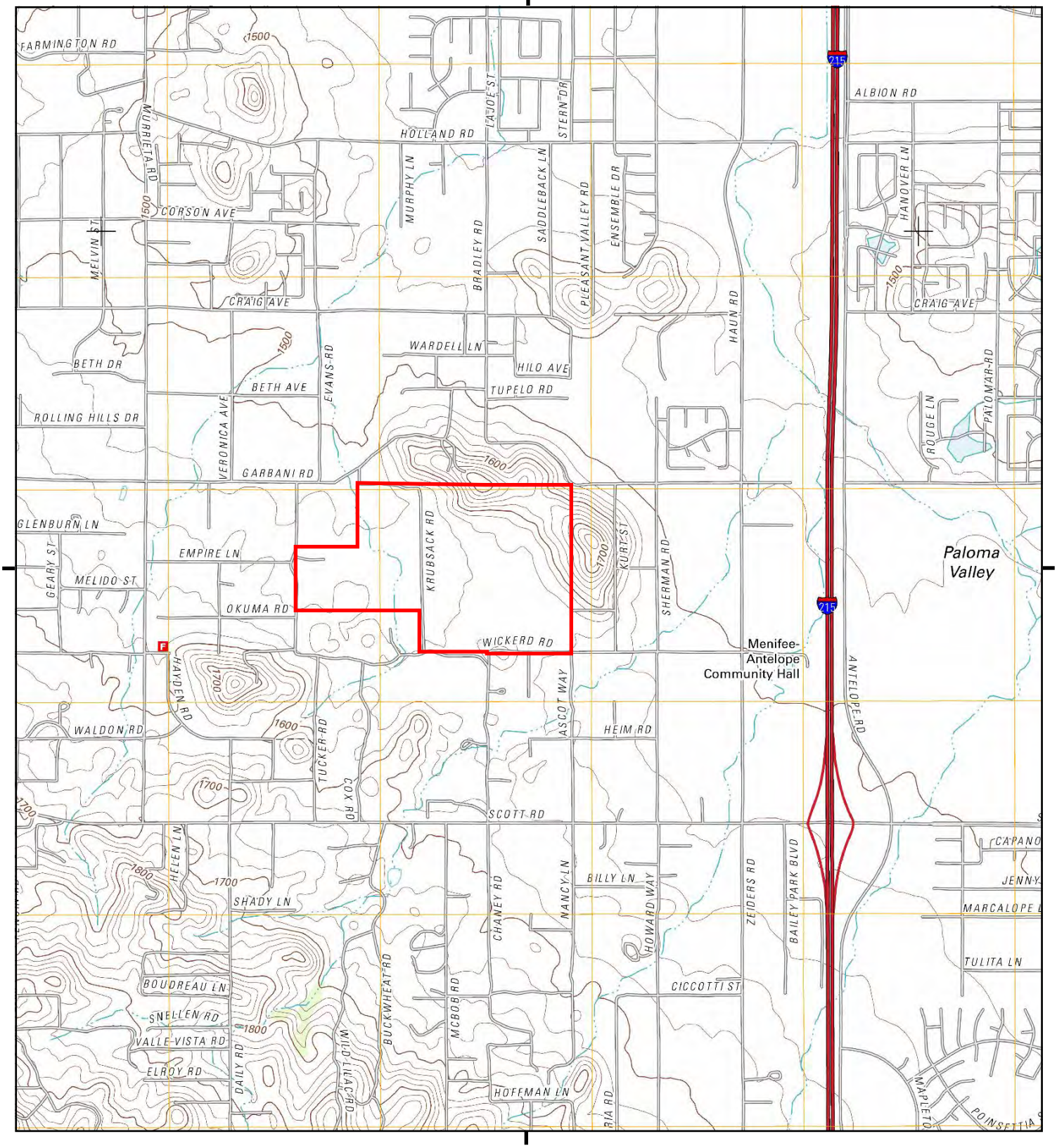
Murrieta
1942
15-minute, 62500
Aerial Photo Revised 1939

1901 Source Sheets

Elsinore
1901
30-minute, 125000

Historical Topo Map

2012



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

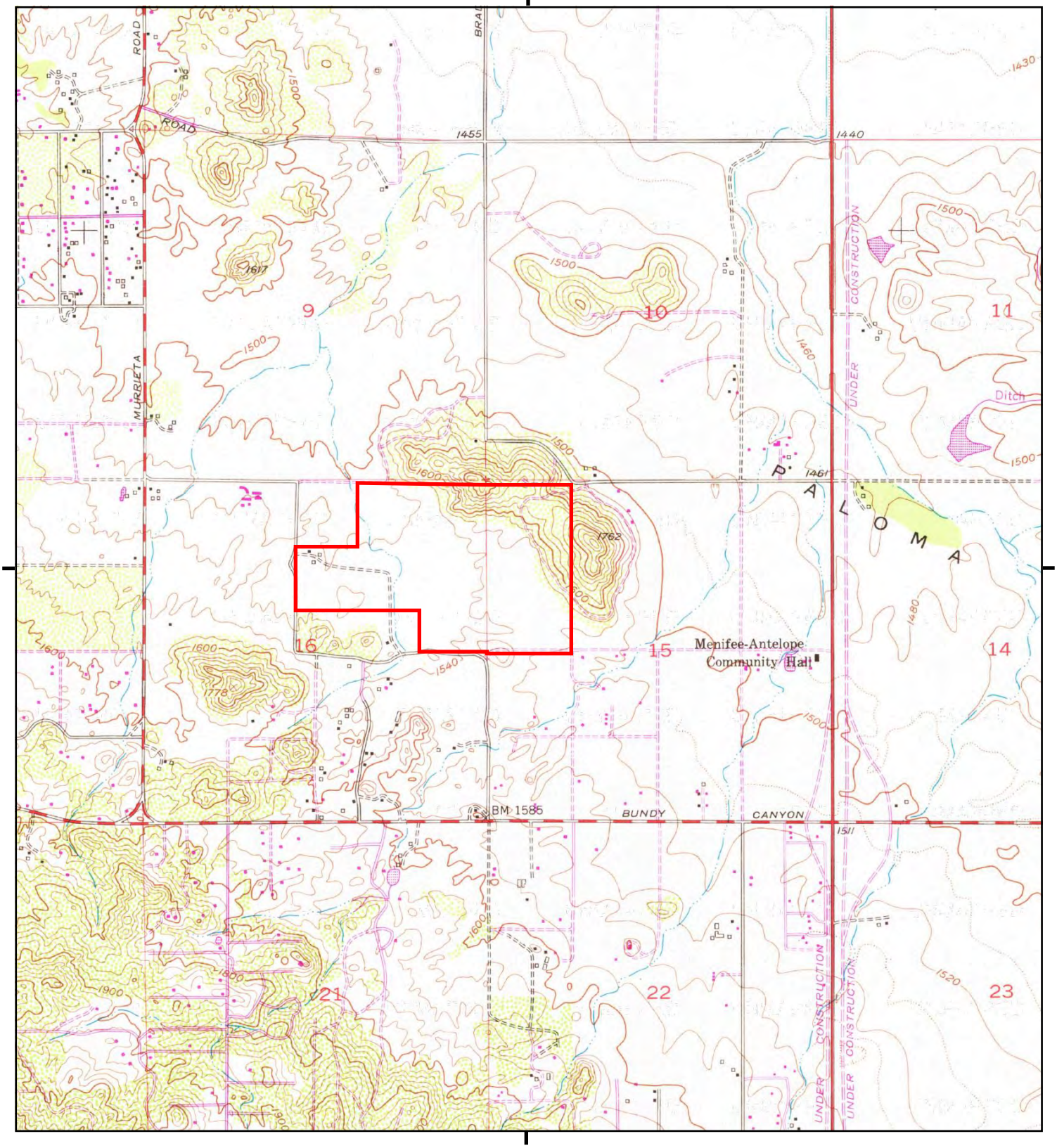
TP, Romoland, 2012, 7.5-minute

SITE NAME: NW of Wicker R and Ascot Way
ADDRESS: NW of Wicker R and Ascot Way
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1979



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

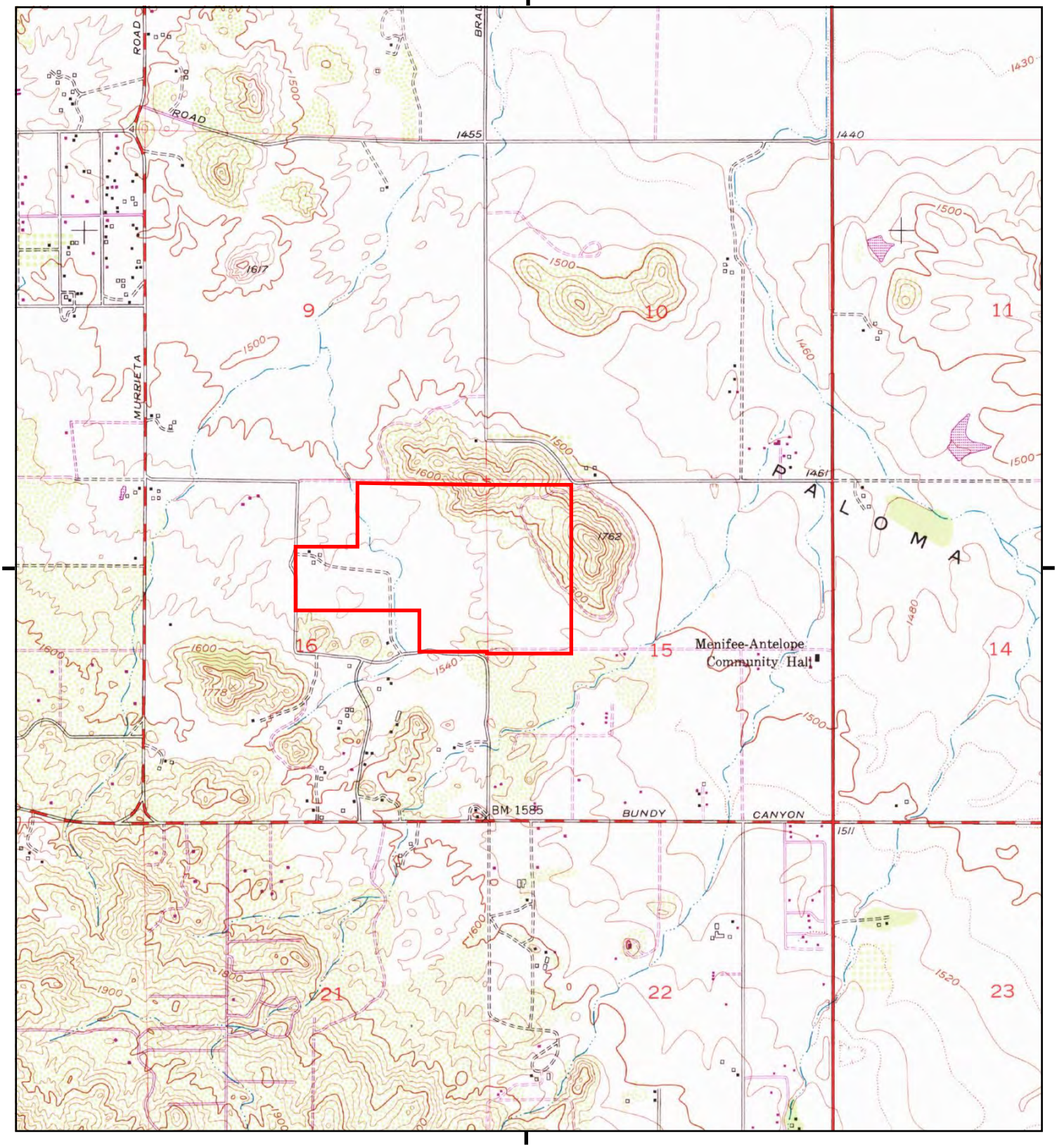
TP, Romoland, 1979, 7.5-minute

SITE NAME: NW of Wicker R and Ascot Way
ADDRESS: NW of Wicker R and Ascot Way
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1973



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

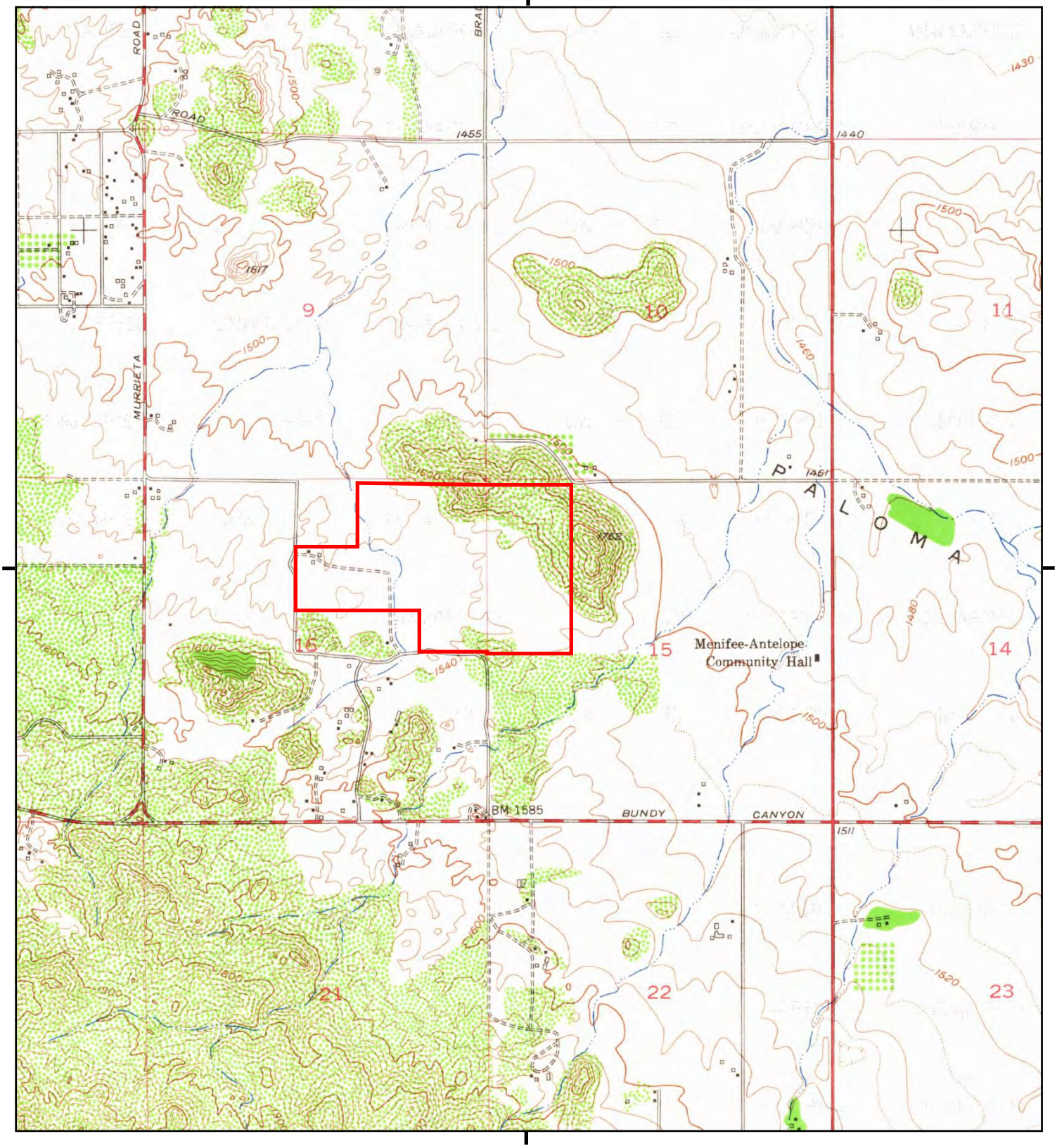
TP, Romoland, 1973, 7.5-minute

SITE NAME: NW of Wicker R and Ascot Way
ADDRESS: NW of Wicker R and Ascot Way
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1953



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

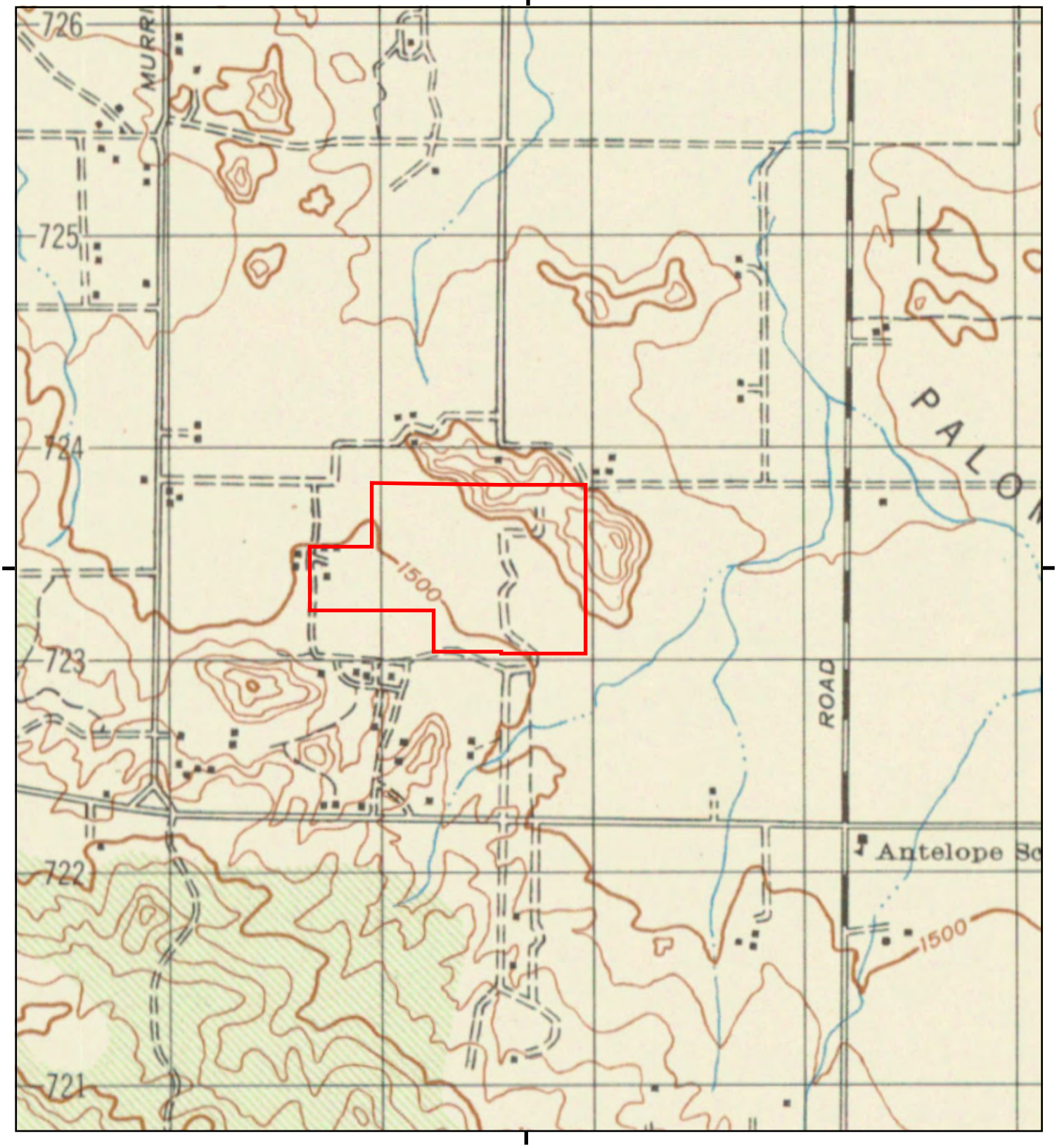
TP, Romoland, 1953, 7.5-minute

SITE NAME: NW of Wicker R and Ascot Way
ADDRESS: NW of Wicker R and Ascot Way
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1947



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

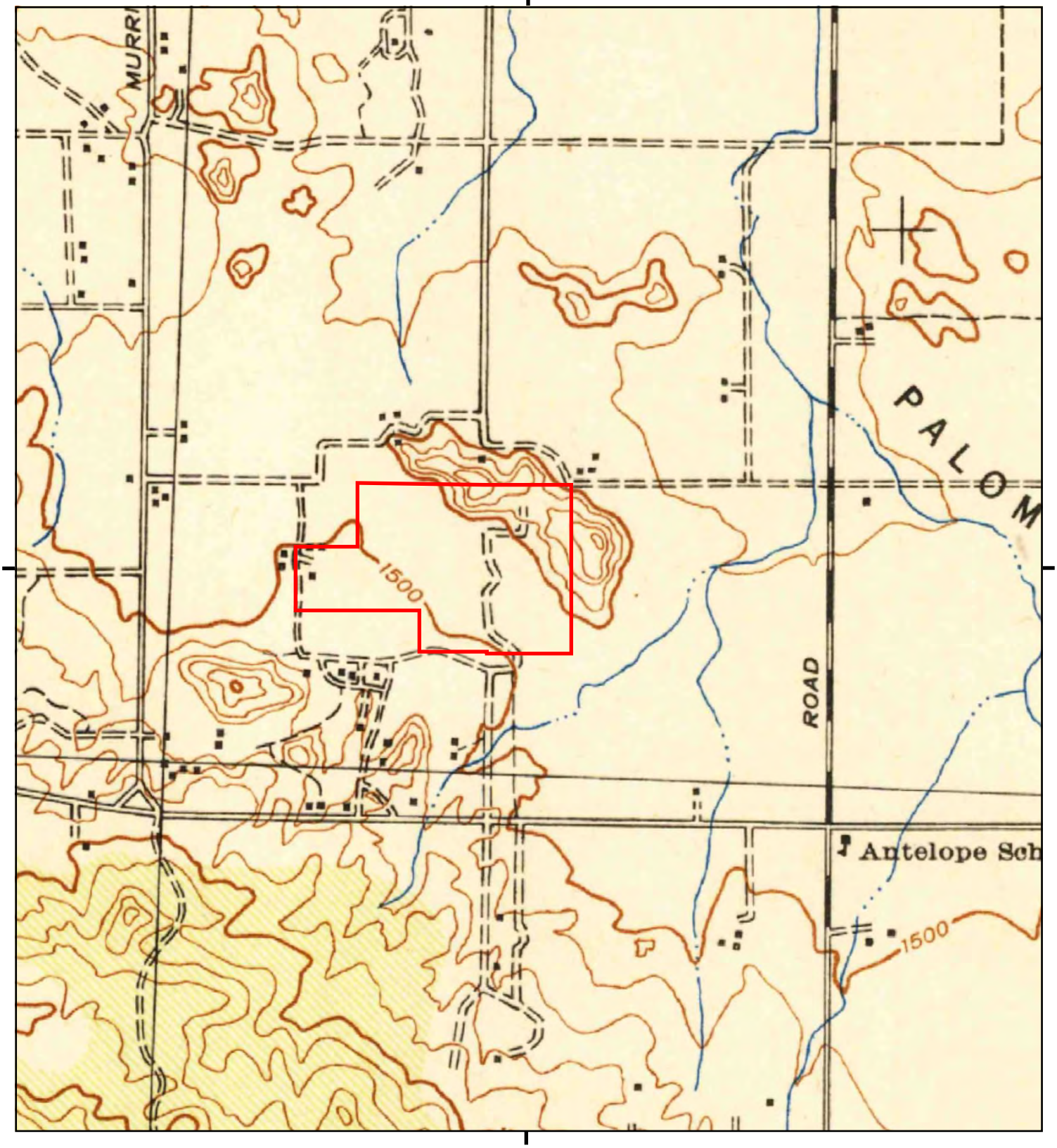
TP, MURRIETA, 1947, 15-minute

SITE NAME: NW of Wicker R and Ascot Way
ADDRESS: NW of Wicker R and Ascot Way
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1943



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

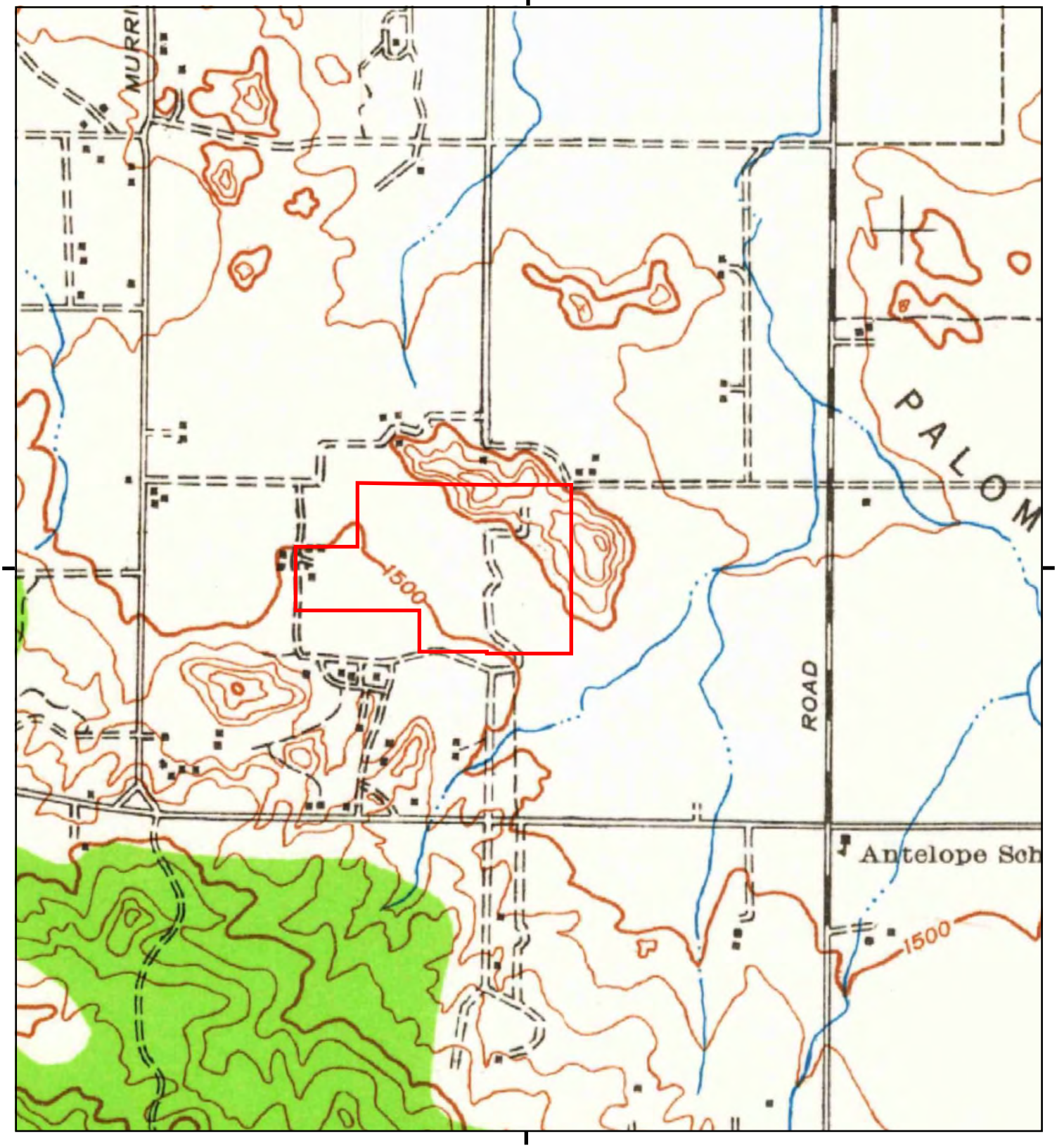
TP, Murrieta, 1943, 15-minute

SITE NAME: NW of Wicker R and Ascot Way
ADDRESS: NW of Wicker R and Ascot Way
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

Historical Topo Map

1942



This report includes information from the following map sheet(s).

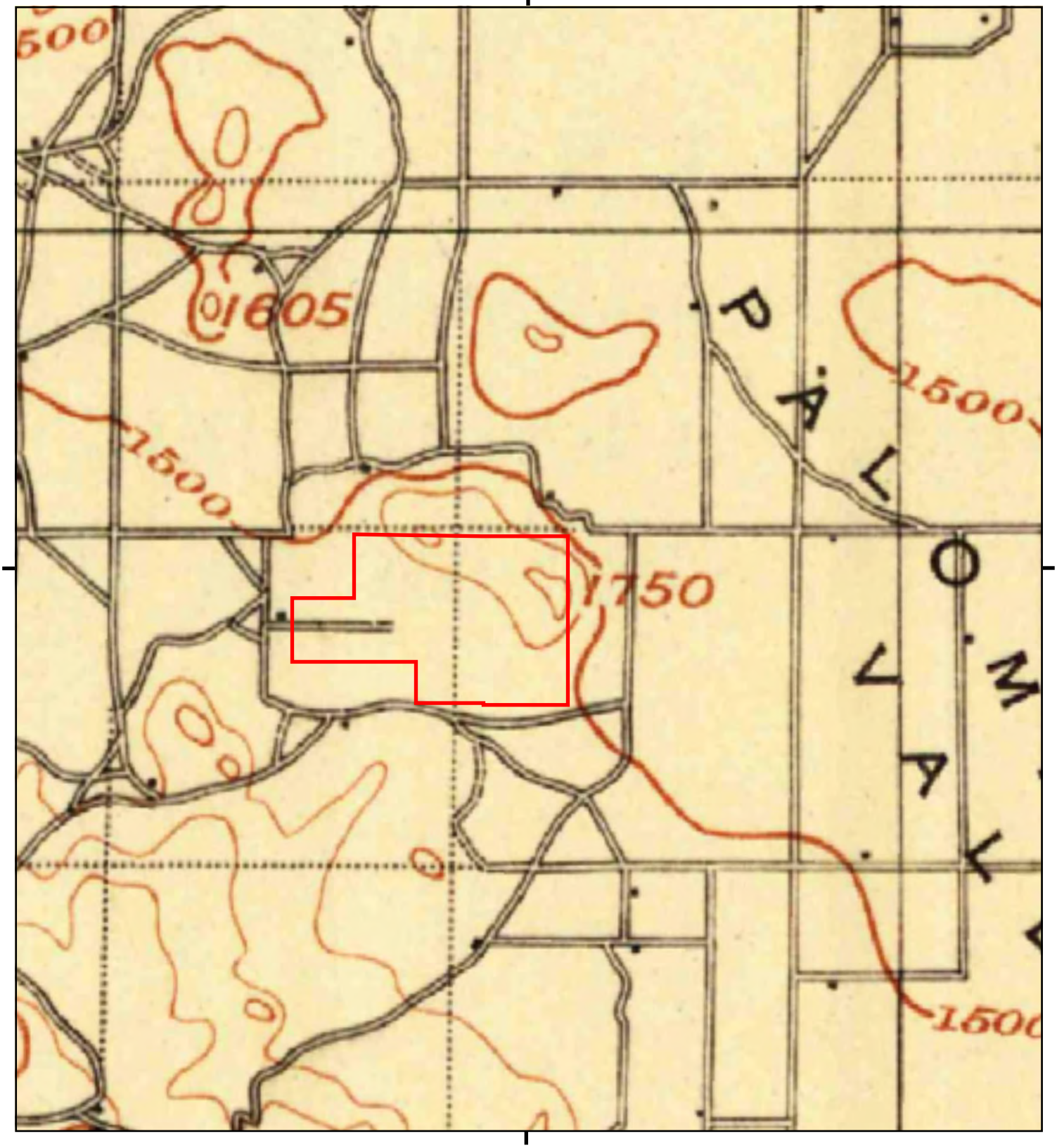
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Murrieta, 1942, 15-minute

SITE NAME: NW of Wicker R and Ascot Way
ADDRESS: NW of Wicker R and Ascot Way
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Elsinore, 1901, 30-minute

SITE NAME: NW of Wicker R and Ascot Way
ADDRESS: NW of Wicker R and Ascot Way
Menifee, CA 92584
CLIENT: Hillmann Environmental Co.

N

APPENDIX E

REGULATORY RECORDS DOCUMENTATION

NW of Wicker R and Ascot Way
NW of Wicker R and Ascot Way
Menifee, CA 92584

Inquiry Number: 06595663.2r
July 28, 2021

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Map Findings Summary	4
Map Findings	9
Orphan Summary	40
Government Records Searched/Data Currency Tracking	GR-1

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Physical Setting Source Summary	A-2
Physical Setting SSURGO Soil Map	A-5
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Physical Setting Source Records Searched	PSGR-1

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with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

NW OF WICKER R AND ASCOT WAY
MENIFEE, CA 92584

COORDINATES

Latitude (North):	33.6523570 - 33° 39' 8.48''
Longitude (West):	117.1865160 - 117° 11' 11.45''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	482705.4
UTM Y (Meters):	3723433.5
Elevation:	1559 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5641314 ROMOLAND, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140603
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
NW OF WICKER R AND ASCOT WAY
MENIFEE, CA 92584

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	#1 HEAVY EQUIPMENT L	32531 COX RD	RCRA NonGen / NLR	Lower	1133, 0.215, SW
A2	MAINTENANCE OPERATIO	26301 GARBANI RD	HIST CORTESE, WDS	Lower	1242, 0.235, WNW
A3	MENIFEE FACILITY	26301 GARBANI RD	RCRA NonGen / NLR	Lower	1242, 0.235, WNW
A4	MUSD - MENIFEE ELEME	26301 GARBANI RD	CERS HAZ WASTE, HAZNET, CERS, HWTS	Lower	1242, 0.235, WNW
A5	MENIFEE UNION SCHOOL	26301 GARBONI RD	LUST, Cortese, CERS	Lower	1242, 0.235, WNW
A6	MENIFEE UNION SCHOOL	26301 GARBONI RD	SWEEPS UST	Lower	1242, 0.235, WNW
A7	MUSD - TRANSPORTATIO	26301 GARBANI RD	RCRA NonGen / NLR	Lower	1242, 0.235, WNW
B8	GTE MURRIETA PLANT Y	32477 HAUN RD	LUST, SWEEPS UST, CA FID UST, HIST CORTESE	Lower	2632, 0.498, ESE
B9	GTE-MURRIETA PLANT Y	32477 HAUN RD	LUST, Cortese, CERS	Lower	2636, 0.499, ESE
10	PERRIS UNION HIGH SC	31375 BRADLEY ROAD	ENVIROSTOR, SCH, CERS	Lower	2962, 0.561, North
11	PALOMA HIGH SCHOOL E	31375 BRADLEY ROAD	ENVIROSTOR, SCH	Lower	3394, 0.643, NNW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROLS ..... Institutional Controls Sites List

Federal ERNS list

ERNS ..... Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE ..... State Response Sites

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ..... Solid Waste Information System

State and tribal leaking storage tank lists

INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land
CPS-SLIC ..... Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST ..... Underground Storage Tank Listing
UST ..... Active UST Facilities
AST ..... Aboveground Petroleum Storage Tank Facilities
INDIAN UST ..... Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

VCP ..... Voluntary Cleanup Program Properties
INDIAN VCP ..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ..... Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT ..... Waste Management Unit Database
SWRCY ..... Recycler Database
HAULERS ..... Registered Waste Tire Haulers Listing
INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands
ODI ..... Open Dump Inventory
DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS ..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ..... Delisted National Clandestine Laboratory Register

HIST Cal-Sites ---- Historical Calsites Database
SCH ---- School Property Evaluation Program
CDL ---- Clandestine Drug Labs
Toxic Pits ---- Toxic Pits Cleanup Act Sites
US CDL ---- National Clandestine Laboratory Register
PFAS ---- PFAS Contamination Site Location Listing

Local Lists of Registered Storage Tanks

HIST UST ---- Hazardous Substance Storage Container Database
CA FID UST ---- Facility Inventory Database
CERS TANKS ---- California Environmental Reporting System (CERS) Tanks

Local Land Records

LIENS ---- Environmental Liens Listing
LIENS 2 ---- CERCLA Lien Information
DEED ---- Deed Restriction Listing

Records of Emergency Release Reports

HMIRS ---- Hazardous Materials Information Reporting System
CHMIRS ---- California Hazardous Material Incident Report System
LDS ---- Land Disposal Sites Listing
MCS ---- Military Cleanup Sites Listing
SPILLS 90 ---- SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS ---- Formerly Used Defense Sites
DOD ---- Department of Defense Sites
SCRD DRYCLEANERS ---- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ---- Financial Assurance Information
EPA WATCH LIST ---- EPA WATCH LIST
2020 COR ACTION ---- 2020 Corrective Action Program List
TSCA ---- Toxic Substances Control Act
TRIS ---- Toxic Chemical Release Inventory System
SSTS ---- Section 7 Tracking Systems
ROD ---- Records Of Decision
RMP ---- Risk Management Plans
RAATS ---- RCRA Administrative Action Tracking System
PRP ---- Potentially Responsible Parties
PADS ---- PCB Activity Database System
ICIS ---- Integrated Compliance Information System
FTTS ---- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ---- Material Licensing Tracking System
COAL ASH DOE ---- Steam-Electric Plant Operation Data
COAL ASH EPA ---- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ---- PCB Transformer Registration Database
RADINFO ---- Radiation Information Database
HIST FTTS ---- FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ---- Incident and Accident Data
CONSENT ---- Superfund (CERCLA) Consent Decrees
INDIAN RESERV ---- Indian Reservations

FUSRAP ---- Formerly Utilized Sites Remedial Action Program
UMTRA ---- Uranium Mill Tailings Sites
LEAD SMELTERS ---- Lead Smelter Sites
US AIRS ---- Aerometric Information Retrieval System Facility Subsystem
US MINES ---- Mines Master Index File
ABANDONED MINES ---- Abandoned Mines
FINDS ---- Facility Index System/Facility Registry System
UXO ---- Unexploded Ordnance Sites
ECHO ---- Enforcement & Compliance History Information
DOCKET HWC ---- Hazardous Waste Compliance Docket Listing
FUELS PROGRAM ---- EPA Fuels Program Registered Listing
CA BOND EXP. PLAN ---- Bond Expenditure Plan
CUPA Listings ---- CUPA Resources List
DRYCLEANERS ---- Cleaner Facilities
EMI ---- Emissions Inventory Data
ENF ---- Enforcement Action Listing
Financial Assurance ---- Financial Assurance Information Listing
HAZNET ---- Facility and Manifest Data
ICE ---- ICE
HWP ---- EnviroStor Permitted Facilities Listing
HWT ---- Registered Hazardous Waste Transporter Database
MINES ---- Mines Site Location Listing
MWMP ---- Medical Waste Management Program Listing
NPDES ---- NPDES Permits Listing
PEST LIC ---- Pesticide Regulation Licenses Listing
PROC ---- Certified Processors Database
Notify 65 ---- Proposition 65 Records
UIC ---- UIC Listing
UIC GEO ---- UIC GEO (GEOTRACKER)
WASTEWATER PITS ---- Oil Wastewater Pits Listing
WDS ---- Waste Discharge System
WIP ---- Well Investigation Program Case List
MILITARY PRIV SITES ---- MILITARY PRIV SITES (GEOTRACKER)
PROJECT ---- PROJECT (GEOTRACKER)
WDR ---- Waste Discharge Requirements Listing
CIWQS ---- California Integrated Water Quality System
CERS ---- CERS
NON-CASE INFO ---- NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS ---- OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS ---- PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT ---- SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ ---- Well Stimulation Project (GEOTRACKER)
MINES MRDS ---- Mineral Resources Data System
HWTS ---- Hazardous Waste Tracking System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---- EDR Proprietary Manufactured Gas Plants
EDR Hist Auto ---- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ---- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---- Recovered Government Archive Solid Waste Facilities List

EXECUTIVE SUMMARY

RGA LUST ---------- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 04/23/2021 has revealed that there are 2 ENVIROSTOR sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
PERRIS UNION HIGH SC Facility Id: 33880002 Status: No Action Required	***31375 BRADLEY ROAD***	***N 1/2 - 1 (0.561 mi.)***	***10***	***35***
PALOMA HIGH SCHOOL E Facility Id: 70000072 Status: No Action Required	***31375 BRADLEY ROAD***	***NNW 1/2 - 1 (0.643 mi.)***	***11***	***37***

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 3 LUST sites within

approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MENIFEE UNION SCHOOL	***26301 GARBONI RD***	***WNW 1/8 - 1/4 (0.235 mi.)***	***A5***	***21***

Database: LUST REG 8, Date of Government Version: 02/14/2005
Database: LUST, Date of Government Version: 03/08/2021
Database: RIVERSIDE CO. LUST, Date of Government Version: 06/29/2021
Status: Completed - Case Closed
Facility Status: Case Closed
Facility Id: 96091
Global Id: T0606500451
Facility Status: 9
Global ID: T0606500451

GTE MURRIETA PLANT Y	***32477 HAUN RD***	***ESE 1/4 - 1/2 (0.498 mi.)***	***B8***	***28***

Database: LUST REG 8, Date of Government Version: 02/14/2005
Facility Status: Case Closed
Global ID: T0606500529

GTE-MURRIETA PLANT Y	***32477 HAUN RD***	***ESE 1/4 - 1/2 (0.499 mi.)***	***B9***	***32***

Database: LUST, Date of Government Version: 03/08/2021
Database: RIVERSIDE CO. LUST, Date of Government Version: 06/29/2021
Status: Completed - Case Closed
Facility Id: 971216
Global Id: T0606500529
Facility Status: 9

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

CERS HAZ WASTE: List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

A review of the CERS HAZ WASTE list, as provided by EDR, and dated 04/19/2021 has revealed that there is 1 CERS HAZ WASTE site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MUSD - MENIFEE ELEME	***26301 GARBANI RD***	***WNW 1/8 - 1/4 (0.235 mi.)***	***A4***	***15***

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is 1 SWEEPS UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MENIFEE UNION SCHOOL Status: A Tank Status: A Comp Number: 90184	26301 GARBONI RD	WNW 1/8 - 1/4 (0.235 mi.)	A6	25

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/22/2021 has revealed that there are 3 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
#1 HEAVY EQUIPMENT L EPA ID:: CAL000432600	32531 COX RD	SW 1/8 - 1/4 (0.215 mi.)	1	9
MENIFEE FACILITY EPA ID:: CAL000418642	26301 GARBANI RD	WNW 1/8 - 1/4 (0.235 mi.)	A3	12
MUSD - TRANSPORTATIO EPA ID:: CAL000295904	26301 GARBANI RD	WNW 1/8 - 1/4 (0.235 mi.)	A7	26

Cortese: The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

A review of the Cortese list, as provided by EDR, and dated 03/22/2021 has revealed that there are 2 Cortese sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MENIFEE UNION SCHOOL Cleanup Status: COMPLETED - CASE CLOSED	***26301 GARBONI RD***	***WNW 1/8 - 1/4 (0.235 mi.)***	***A5***	***21***
GTE-MURRIETA PLANT Y Cleanup Status: COMPLETED - CASE CLOSED	***32477 HAUN RD***	***ESE 1/4 - 1/2 (0.499 mi.)***	***B9***	***32***

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 2 HIST CORTESE sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MAINTENANCE OPERATIO	***26301 GARBANI RD***	***WNW 1/8 - 1/4 (0.235 mi.)***	***A2***	***11***

EXECUTIVE SUMMARY

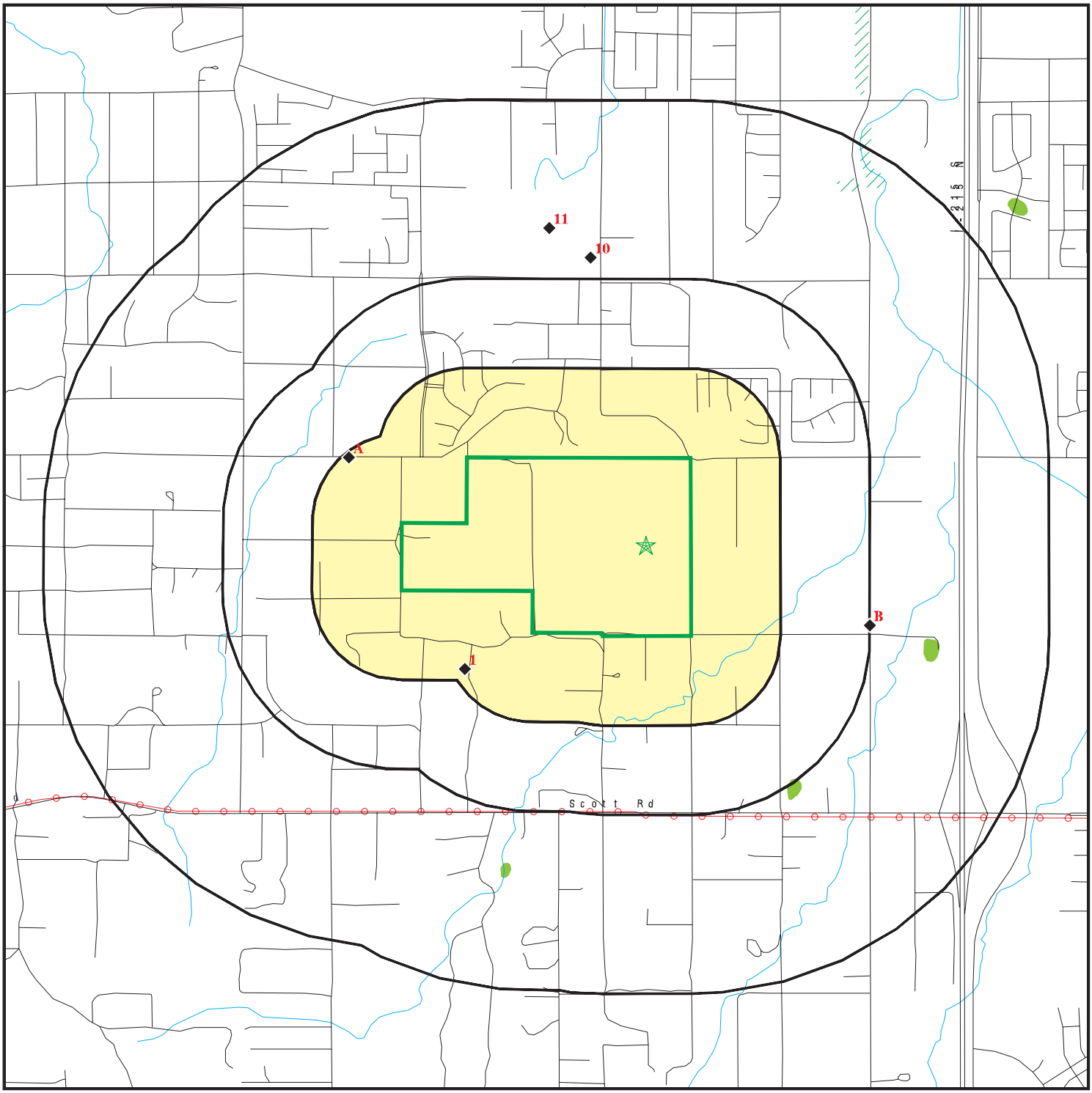
Reg Id: 083302792T				
GTE MURRIETA PLANT Y	***32477 HAUN RD***	***ESE 1/4 - 1/2 (0.498 mi.)***	***B8***	***28***
Reg Id: 083303193T				

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 4 records.

Site Name	Database(s)
	CDL
	CDL
	CDL
PROPOSED ELEMENTARY SCHOOL NO. 15	ENVIROSTOR, SCH

OVERVIEW MAP - 06595663.2R



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	NW of Wicker R and Ascot Way	CLIENT:	Hillmann Environmental Co.
ADDRESS:	NW of Wicker R and Ascot Way Menifee CA 92584	CONTACT:	Shilpa Sunil
LAT/LONG:	33.652357 / 117.186516	INQUIRY #:	06595663.2r
		DATE:	July 28, 2021 9:07 am

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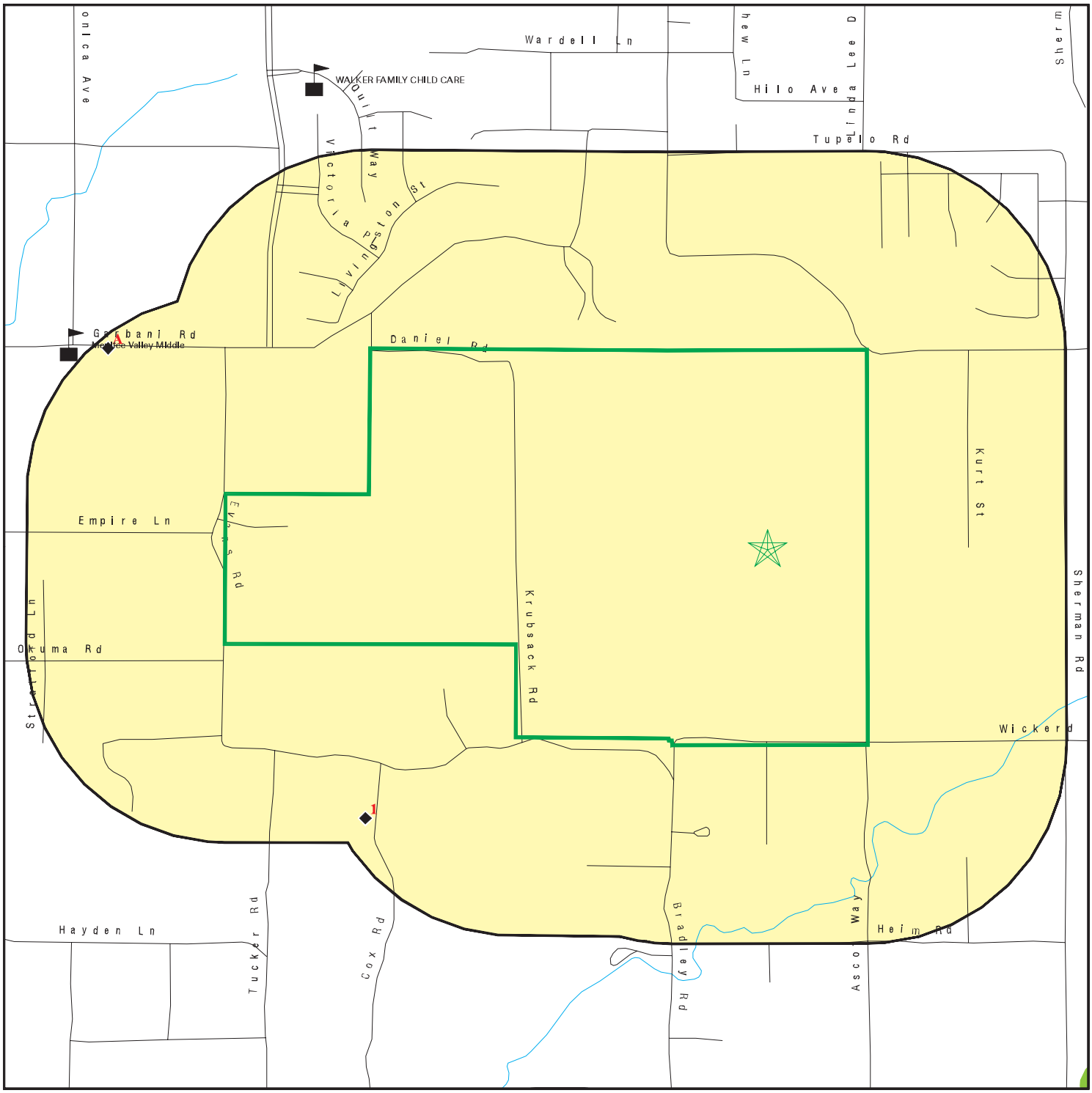
DETAIL MAP - 06595663.2R



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	NW of Wicker R and Ascot Way	CLIENT:	Hillmann Environmental Co.
ADDRESS:	NW of Wicker R and Ascot Way Menifee CA 92584	CONTACT:	Shilpa Sunil
LAT/LONG:	33.652357 / 117.186516	INQUIRY #:	06595663.2r
		DATE:	July 28, 2021 9:10 am

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	2	NR	2
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	1	2	NR	NR	3

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
CERS HAZ WASTE	0.250		0	1	NR	NR	NR	1
US CDL	0.001		0	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	1	NR	NR	NR	1
HIST UST	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	0	NR	NR	NR	0
CERS TANKS	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	3	NR	NR	NR	3
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	1	1	NR	NR	2
CUPA Listings	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HAZNET	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	1	1	NR	NR	2
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
MINES MRDS	0.001		0	NR	NR	NR	NR	0
HWTS	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	0	8	4	2	0	14

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1
SW
1/8-1/4
0.215 mi.
1133 ft.

#1 HEAVY EQUIPMENT LOADING INC
32531 COX RD
MENIFEE, CA 92584

RCRA NonGen / NLR

1024864044
CAL000432600

Relative:
Lower

Actual:
1550 ft.

RCRA NonGen / NLR:

Date Form Received by Agency:	2017-12-14 00:00:00.0
Handler Name:	#1 HEAVY EQUIPMENT LOADING INC
Handler Address:	32531 COX RD
Handler City,State,Zip:	MENIFEE, CA 92584-9635
EPA ID:	CAL000432600
Contact Name:	LINAS KEVLICIUS
Contact Address:	5166 W 64TH PL
Contact City,State,Zip:	CHICAGO, IL 60638
Contact Telephone:	773-965-1111
Contact Fax:	Not reported
Contact Email:	Not reported
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Handler Activities
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	6535 S AUSTIN AVE
Mailing City,State,Zip:	BEDFORD PARK, IL 60638-6108
Owner Name:	LINAS KEVLICIUS
Owner Type:	Other
Operator Name:	LINAS KEVLICIUS
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	Yes
Universal Waste Destination Facility:	Yes
Federal Universal Waste:	No
Active Site Fed-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site Converter Treatment storage and Disposal Facility:	Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
Commercial TSD Indicator:	No
Treatment Storage and Disposal Type:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
Permit Renewals Workload Universe:	Not reported

#1 HEAVY EQUIPMENT LOADING INC (Continued) **1024864044**

Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2018-09-07 19:37:08.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Operator
Owner/Operator Name:	LINAS KEVLICIUS
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	5166 W 64TH PL
Owner/Operator City,State,Zip:	CHICAGO, IL 60638
Owner/Operator Telephone:	773-965-1111
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name:	LINAS KEVLICIUS
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	5166 W 64TH PL
Owner/Operator City,State,Zip:	CHICAGO, IL 60638
Owner/Operator Telephone:	773-965-1111
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

#1 HEAVY EQUIPMENT LOADING INC (Continued) **1024864044**

Historic Generators:
Receive Date: 2017-12-14 00:00:00.0
Handler Name: #1 HEAVY EQUIPMENT LOADING INC
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 722310
NAICS Description: FOOD SERVICE CONTRACTORS

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

A2 **MAINTENANCE OPERATIONS & TRA** **HIST CORTESE** **S103978701**
WNW **26301 GARBANI RD** **WDS** **N/A**
1/8-1/4 **MENIFEE, CA 92584**
0.235 mi.
1242 ft. **Site 1 of 6 in cluster A**

Relative: **Lower**
Actual: **1518 ft.**

HIST CORTESE:
edr_fname: MENIFEE UNION SCHOOL DIST
edr_fadd1: 26301
City,State,Zip: MENIFEE, CA 92058
Region: CORTESE
Facility County Code: 33
Reg By: LTNKA
Reg Id: 083302792T

WDS:
Name: MAINTENANCE OPERATIONS & TRA
Address: 26301 GARBANI RD
City: MENIFEE
Facility ID: Santa Ana River 33I017951
Facility Type: Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status: Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number: CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board

MAINTENANCE OPERATIONS & TRA (Continued) **S103978701**

Subregion:	8
Facility Telephone:	9096796833
Facility Contact:	BROWN DAVID
Agency Name:	MENIFEE UNION SCHOOL DISTRICT
Agency Address:	30205 MENIFEE ROAD
Agency City,St,Zip:	MENIFEE 92584
Agency Contact:	DAN WOOD
Agency Telephone:	Not reported
Agency Type:	Special District (Includes districts established under general acts, sanitary districts, water districts irrigation districts, etc.)
SIC Code:	0
SIC Code 2:	Not reported
Primary Waste Type:	Not reported
Primary Waste:	Not reported
Waste Type2:	Not reported
Waste2:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	Not reported
POTW:	Not reported
Treat To Water:	Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.
Complexity:	Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

A3 **MENIFEE FACILITY** **RCRA NonGen / NLR** **1024855675**
WNW **26301 GARBANI RD** **CAL000418642**
1/8-1/4 **MENIFEE, CA 92584**
0.235 mi.
1242 ft. **Site 2 of 6 in cluster A**

Relative: RCRA NonGen / NLR:
Lower

Date Form Received by Agency:		2016-07-05 00:00:00.0
Handler Name:	MENIFEE FACILITY	
Handler Address:		26301 GARBANI RD
Handler City,State,Zip:		MENIFEE, CA 92584-9480
EPA ID:		CAL000418642
Contact Name:		JAMES NIFFEN
Contact Address:		1791 WEST ACACIA AVE
Contact City,State,Zip:		HEMET, CA 92545
Contact Telephone:		951-634-1868
Contact Fax:		951-765-2585
Contact Email:		JNIFFEN@HEMETUSD.ORG
Contact Title:		Not reported
EPA Region:		09
Land Type:		Not reported
Federal Waste Generator Description:		Not a generator, verified

Actual:
1518 ft.

MENIFEE FACILITY (Continued) **1024855675**

Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Handler Activities
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	1791 W ACACIA AVE
Mailing City,State,Zip:	HEMET, CA 92545-3797
Owner Name:	HEMET UNIFIED SCHOOL DISTRICT
Owner Type:	Other
Operator Name:	JAMES NIFFEN
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	Yes
Universal Waste Destination Facility:	Yes
Federal Universal Waste:	No
Active Site Fed-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site Converter Treatment storage and Disposal Facility:	Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
Commercial TSD Indicator:	No
Treatment Storage and Disposal Type:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
Permit Renewals Workload Universe:	Not reported
Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No

MENIFEE FACILITY (Continued) **1024855675**

Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2018-09-06 17:07:58.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Operator
Owner/Operator Name:	JAMES NIFFEN
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	1791 WEST ACACIA AVE
Owner/Operator City,State,Zip:	HEMET, CA 92545
Owner/Operator Telephone:	951-634-1868
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name:	HEMET UNIFIED SCHOOL DISTRICT
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	1791 W ACACIA AVE
Owner/Operator City,State,Zip:	HEMET, CA 92545-3797
Owner/Operator Telephone:	951-765-5100
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	2016-07-05 00:00:00.0
Handler Name: MENIFEE FACILITY	
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

List of NAICS Codes and Descriptions:

NAICS Code:	811111
NAICS Description:	GENERAL AUTOMOTIVE REPAIR

MENIFEE FACILITY (Continued) **1024855675**

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

A4 **MUSD - MENIFEE ELEMENTARY SCHOOL** **CERS HAZ WASTE** **S112890296**
WNW **26301 GARBANI RD** **HAZNET** **N/A**
1/8-1/4 **MENIFEE, CA 92584** **CERS**
0.235 mi. **HWTS**
1242 ft. **Site 3 of 6 in cluster A**

Relative:
Lower

Actual:
1518 ft.

CERS HAZ WASTE:
Name: MENIFEE UNION SCHOOL DISTRICT
Address: 26301 GARBANI RD
City,State,Zip: MENIFEE, CA 92584
Site ID: 134206
CERS ID: 10317268
CERS Description: Hazardous Waste Generator

HAZNET:
Name: MUSD - MENIFEE ELEMENTARY SCHOOL
Address: 26301 GARBANI RD
Address 2: Not reported
City,State,Zip: MENIFEE, CA 925840000
Contact: DAN WOOD
Telephone: 9096721851
Mailing Name: Not reported
Mailing Address: 30205 MENIFEE RD

Year: 1998
Gepaid: CAC001423160
TSD EPA ID: CAT080013352
CA Waste Code: 223 - Unspecified oil-containing waste
Disposal Method: R01 - Recycler
Tons: 7.089

Additional Info:
Year: 1998
Gen EPA ID: CAC001423160

Shipment Date: 19981222
Creation Date: 3/15/1999 0:00:00
Receipt Date: 19981223
Manifest ID: 96582158
Trans EPA ID: CAD982525024
Trans Name: Not reported
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported
TSDF EPA ID: CAT080013352
Trans Name: Not reported
TSDF Alt EPA ID: Not reported
TSDF Alt Name: Not reported
Waste Code Description: 223 - Unspecified oil-containing waste

MUSD - MENIFEE ELEMENTARY SCHOOL (Continued) **S112890296**

RCRA Code:	D001
Meth Code:	R01 - Recycler
Quantity Tons:	7.089
Waste Quantity:	1700
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

CERS:

Name:	MENIFEE UNION SCHOOL DISTRICT
Address:	26301 GARBANI RD
City,State,Zip:	MENIFEE, CA 92584
Site ID:	134206
CERS ID:	10317268
CERS Description:	Chemical Storage Facilities

Violations:

Site ID:	134206
Site Name:	Menifee Union School District
Violation Date:	09-22-2020
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
Violation Notes:	OBSERVATION: The hazardous materials business plan (HMBP) was due for submittal by 06/30/2020 and has not yet been submitted. CORRECTIVE ACTION: Owner/Operator shall submit an updated business plan in the statewide information management system (e.g. CERS) at http://cers.calepa.ca.gov. Business plans shall be reviewed and certified on at least an annual basis. HMBP submittal due date is concurrent with the permit expiration date.
Violation Division:	Riverside County Department of Env Health
Violation Program:	HMRRP
Violation Source:	CERS

Site ID:	134206
Site Name:	Menifee Union School District
Violation Date:	09-22-2020
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes:	OBSERVATION: The most recent business plan submission in the statewide information management system (CERS) did not contain refrigerants (R22 and 410A) and the botanical disinfectant solution that were observed in the welding shop. CORRECTIVE ACTION: Owner/operator shall complete a chemical inventory page for all reportable hazardous materials on site and submit to the statewide information management system (e.g. CERS) at http://cers.calepa.ca.gov.
Violation Division:	Riverside County Department of Env Health
Violation Program:	HMRRP
Violation Source:	CERS

MUSD - MENIFEE ELEMENTARY SCHOOL (Continued) **S112890296**

Site ID:	134206
Site Name:	Menifee Union School District
Violation Date:	09-22-2020
Citation:	Un-Specified
Violation Description:	Business Plan Program - Operations/Maintenance - General Local Ordinance
Violation Notes:	OBSERVATION: The NFPA-704 signs on the gate leading to the area where hazardous materials are stored is deteriorated and requires replacement. Also, the sign on Building 3 requires replacement. The signs on Building 1 and Building 2 should be removed, since hazardous materials are no longer stored in these buildings. CORRECTIVE ACTION: Owner/operator shall replace all faded or otherwise unrecognizable NFPA-704 signs. Submit photos to kgill@rivco.org to correct this violation.
Violation Division:	Riverside County Department of Env Health
Violation Program:	HMRRP
Violation Source:	CERS

Site ID:	134206
Site Name:	Menifee Union School District
Violation Date:	05-27-2015
Citation:	HSC 6.95 25505(a)(4) - California Health and Safety Code, Chapter 6.95, Section(s) 25505(a)(4)
Violation Description:	Failure to provide initial and annual training to all employees in safety procedures in the event of a release or threatened release of a hazardous material or failure to document and maintain training records for a minimum of three years.
Violation Notes:	Returned to compliance on 01/15/2016.
Violation Division:	Riverside County Department of Env Health
Violation Program:	HMRRP
Violation Source:	CERS

Site ID:	134206
Site Name:	Menifee Union School District
Violation Date:	09-22-2020
Citation:	HSC 6.95 25505(a)(4) - California Health and Safety Code, Chapter 6.95, Section(s) 25505(a)(4)
Violation Description:	Failure to provide initial and annual training to all employees in safety procedures in the event of a release or threatened release of a hazardous material or failure to document and maintain training records for a minimum of three years.
Violation Notes:	OBSERVATION: Documentation of employee training regarding onsite hazardous materials was not available for review at the time of inspection. CORRECTIVE ACTION: Owner/operator shall provide training to all employees on an annual basis. Documentation shall be retained and be made available for inspection for a minimum period of 3 years from the date of the training. *Send a copy of hazardous materials employee training to kgill@rivco.org to correct this violation.
Violation Division:	Riverside County Department of Env Health
Violation Program:	HMRRP
Violation Source:	CERS

Site ID:	134206
Site Name:	Menifee Union School District
Violation Date:	05-27-2015
Citation:	HSC 6.95 Multiple - California Health and Safety Code, Chapter 6.95, Section(s) Multiple

MUSD - MENIFEE ELEMENTARY SCHOOL (Continued) **S112890296**

Violation Description: Business Plan Program - Administration/Documentation - General
Violation Notes: Returned to compliance on 01/15/2016.
Violation Division: Riverside County Department of Env Health
Violation Program: HMRRP
Violation Source: CERS

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-27-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: Riverside County Department of Env Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-27-2015
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: Riverside County Department of Env Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-22-2020
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Facility is a transportation yard for Menifee School District. Hazardous waste streams generated onsite consist of waste oil, waste antifreeze, oil filters, and waste aerosol containers.
Eval Division: Riverside County Department of Env Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-22-2020
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Facility is a transportation yard for Menifee School District. Hazardous materials onsite consist of oil, antifreeze, welding gases, refrigerant, and disinfectant solution.
Eval Division: Riverside County Department of Env Health
Eval Program: HMRRP
Eval Source: CERS

Enforcement Action:
Site ID: 134206
Site Name: Menifee Union School District
Site Address: 26301 GARBANI RD
Site City: MENIFEE
Site Zip: 92584
Enf Action Date: 05-27-2015
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection

MUSD - MENIFEE ELEMENTARY SCHOOL (Continued) **S112890296**

Enf Action Notes:	Not reported
Enf Action Division:	Riverside County Department of Env Health
Enf Action Program:	HMRRP
Enf Action Source:	CERS

Coordinates:

Site ID:	134206
Facility Name:	Menifee Union School District
Env Int Type Code:	HWG
Program ID:	10317268
Coord Name:	Not reported
Ref Point Type Desc:	Center of a facility or station.
Latitude:	33.655950
Longitude:	-117.201470

Affiliation:

Affiliation Type Desc:	Legal Owner
Entity Name:	Menifee Union School Dist
Entity Title:	Not reported
Affiliation Address:	29775 Haun Road
Affiliation City:	Menifee
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	92586
Affiliation Phone:	(951) 672-1851

Affiliation Type Desc:	Operator
Entity Name:	Menifee USD
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(951) 672-1851

Affiliation Type Desc:	CUPA District
Entity Name:	Riverside Cnty Env Health
Entity Title:	Not reported
Affiliation Address:	4065 County Circle Drive, Room 104
Affiliation City:	Riverside
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92503
Affiliation Phone:	(951) 358-5055

Affiliation Type Desc:	Environmental Contact
Entity Name:	Jim Sellers
Entity Title:	Not reported
Affiliation Address:	29775 Haun Road
Affiliation City:	Menifee
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92586
Affiliation Phone:	Not reported

MUSD - MENIFEE ELEMENTARY SCHOOL (Continued) **S112890296**

Affiliation Type Desc:	Identification Signer
Entity Name:	Kyle Dee
Entity Title:	Facilities Planner
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Parent Corporation
Entity Name:	Menifee Union School District
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Document Preparer
Entity Name:	Mesina Brimmer
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	26301 Garbani Rd
Affiliation City:	Menifee
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92584
Affiliation Phone:	Not reported

HWTS:

Name:	MUSD - MENIFEE ELEMENTARY SCHOOL
Address:	26301 GARBANI RD
Address 2:	Not reported
City,State,Zip:	MENIFEE, CA 925840000
EPA ID:	CAC001423160
Inactive Date:	10/25/2000
Create Date:	12/16/1998
Last Act Date:	10/25/2000
Mailing Name:	Not reported
Mailing Address:	30205 MENIFEE RD
Mailing Address 2:	Not reported
Mailing City,State,Zip:	MENIFEE, CA 925840000
Owner Name:	MENIFEE UNIFIED SCHOOL DIST
Owner Address:	30205 MENIFEE RD
Owner Address 2:	Not reported

MUSD - MENIFEE ELEMENTARY SCHOOL (Continued) **S112890296**

Owner City,State,Zip:	MENIFEE, CA 925840000
Contact Name:	DAN WOOD
Contact Address:	30205 MENIFEE RD
Contact Address 2:	Not reported
City,State,Zip:	MENIFEE, CA 925840000
Name:	MENIFEE UNION SCHOOL DISTRICT
Address:	26301 GARBANI RD
Address 2:	Not reported
City,State,Zip:	MENIFEE, CA 92584
EPA ID:	CAC002183745
Inactive Date:	01/15/2004
Create Date:	07/18/2003
Last Act Date:	07/18/2003
Mailing Name:	Not reported
Mailing Address:	30205 MENIFEE RD
Mailing Address 2:	Not reported
Mailing City,State,Zip:	MENIFEE, CA 92584
Owner Name:	MENIFEE UNION SCHOOL DISTRICT
Owner Address:	30205 MENIFEE RD
Owner Address 2:	Not reported
Owner City,State,Zip:	MENIFEE, CA 92584
Contact Name:	DAVE BROWN
Contact Address:	30205 MENIFEE RD
Contact Address 2:	Not reported
City,State,Zip:	MENIFEE, CA 92584

A5 **MENIFEE UNION SCHOOL DIST.** **LUST** **U002244632**
WNW **26301 GARBONI RD** **Cortese** **N/A**
1/8-1/4 **MENIFEE, CA 92058** **CERS**
0.235 mi.
1242 ft. **Site 4 of 6 in cluster A**

Relative:
Lower

Actual:
1518 ft.

LUST:

Name:	MENIFEE UNION SCHOOL DIST.
Address:	26301 GARBONI RD
City,State,Zip:	MENIFEE, CA 920584
Lead Agency:	RIVERSIDE COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606500451
Global Id:	T0606500451
Latitude:	33.6591486
Longitude:	-117.1886961
Status:	Completed - Case Closed
Status Date:	11/04/2003
Case Worker:	RIV
RB Case Number:	083302792T
Local Agency:	RIVERSIDE COUNTY LOP
File Location:	Not reported
Local Case Number:	96091
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

LUST:

Global Id:	T0606500451
Contact Type:	Regional Board Caseworker
Contact Name:	CARL BERNHARDT

MENIFEE UNION SCHOOL DIST. (Continued) **U002244632**

Organization Name: SANTA ANA RWQCB (REGION 8)
Address: 3737 MAIN STREET, SUITE 500
City: RIVERSIDE
Email: carl.bernhardt@waterboards.ca.gov
Phone Number: 9517824495

Global Id: T0606500451
Contact Type: Local Agency Caseworker
Contact Name: Riverside County LOP
Organization Name: RIVERSIDE COUNTY LOP
Address: 3880 LEMON ST SUITE 200
City: RIVERSIDE
Email: Not reported
Phone Number: 9519558980

LUST:
Global Id: T0606500451
Action Type: Other
Date: 01/31/1996
Action: Leak Discovery

Global Id: T0606500451
Action Type: Other
Date: 01/31/1996
Action: Leak Stopped

Global Id: T0606500451
Action Type: Other
Date: 02/01/1996
Action: Leak Reported

Global Id: T0606500451
Action Type: ENFORCEMENT
Date: 12/30/2002
Action: Technical Correspondence / Assistance / Other

LUST:
Global Id: T0606500451
Status: Open - Case Begin Date
Status Date: 01/31/1996

Global Id: T0606500451
Status: Open - Site Assessment
Status Date: 01/31/1996

Global Id: T0606500451
Status: Open - Site Assessment
Status Date: 04/30/1996

Global Id: T0606500451
Status: Open - Site Assessment
Status Date: 06/17/1996

Global Id: T0606500451
Status: Open - Site Assessment
Status Date: 09/12/1996

MENIFEE UNION SCHOOL DIST. (Continued) **U002244632**

Global Id: T0606500451
Status: Completed - Case Closed
Status Date: 11/04/2003

LUST REG 8:

Name:	MENIFEE UNION SCHOOL DIST.
Address:	26301 GARBONI RD
City:	MENIFEE
Region:	8
County:	Riverside
Regional Board:	Santa Ana Region
Facility Status:	Case Closed
Case Number:	083302792T
Local Case Num:	96091
Case Type:	Aquifer affected
Substance:	Gasoline
Qty Leaked:	Not reported
Abate Method:	Not reported
Cross Street:	MENIFEE
Enf Type:	TA-CLO
Funding:	Not reported
How Discovered:	Tank Closure
How Stopped:	Not reported
Leak Cause:	UNK
Leak Source:	Tank
Global ID:	T0606500451
How Stopped Date:	1/31/1996
Enter Date:	3/19/1996
Date Confirmation of Leak Began:	1/31/1996
Date Preliminary Assessment Began:	6/17/1996
Discover Date:	1/31/1996
Enforcement Date:	Not reported
Close Date:	11/4/2003
Date Prelim Assessment Workplan Submitted:	4/30/1996
Date Pollution Characterization Began:	9/12/1996
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	3/19/1996
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.6591486
Longitude:	-117.1886961
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	1
MTBE Tested:	Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
MTBE Class:	*
Staff:	CAB
Staff Initials:	UNK

MENIFEE UNION SCHOOL DIST. (Continued) **U002244632**

Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	SAN JACINTO (8-5)
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: Not reported

RIVERSIDE CO. LUST:

Name:	MENIFEE UNION SCHOOL DISTRICT
Address:	26301 GARBONI RD
City,State,Zip:	MENIFEE, CA
Region:	RIVERSIDE
Facility ID:	96091
Employee:	Winters
Site Closed:	Yes
Case Type:	Drinking Water Aquifer affected
Facility Status:	closed/action completed
Casetype Decode:	An Aquifer used for Drinking Water supply has been contaminated.
Fstatus Decode:	Closed/Action completed

CORTESE:

Name:	MENIFEE UNION SCHOOL DIST.
Address:	26301 GARBONI RD
City,State,Zip:	MENIFEE, CA 920584
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0606500451
Site/Facility Type:	LUST CLEANUP SITE
Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

CERS:

Name:	MENIFEE UNION SCHOOL DIST.
Address:	26301 GARBONI RD
City,State,Zip:	MENIFEE, CA 920584
Site ID:	251117
CERS ID:	T0606500451
CERS Description:	Leaking Underground Storage Tank Cleanup Site

MENIFEE UNION SCHOOL DIST. (Continued) **U002244632**

Affiliation:

Affiliation Type Desc:	Local Agency Caseworker
Entity Name:	Riverside County LOP - RIVERSIDE COUNTY LOP
Entity Title:	Not reported
Affiliation Address:	3880 LEMON ST SUITE 200
Affiliation City:	RIVERSIDE
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	9519558980

Affiliation Type Desc:	Regional Board Caseworker
Entity Name:	CARL BERNHARDT - SANTA ANA RWQCB (REGION 8)
Entity Title:	Not reported
Affiliation Address:	3737 MAIN STREET, SUITE 500
Affiliation City:	RIVERSIDE
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	9517824495

A6 **MENIFEE UNION SCHOOL DISTRICT** **SWEEPS UST** **S103821010**
WNW **26301 GARBONI RD** **N/A**
1/8-1/4 **MENIFEE, CA 92584**
0.235 mi.
1242 ft. **Site 5 of 6 in cluster A**

Relative:
Lower

Actual:
1518 ft.

SWEEPS UST:

Name:	MENIFEE UNION SCHOOL DISTRICT
Address:	26301 GARBONI RD
City:	MENIFEE
Status:	Active
Comp Number:	90184
Number:	6
Board Of Equalization:	44-676096
Referral Date:	01-07-94
Action Date:	05-16-94
Created Date:	05-16-94
Owner Tank Id:	1
SWRCB Tank Id:	33-000-090184-000001
Tank Status:	A
Capacity:	550
Active Date:	01-07-94
Tank Use:	M.V. FUEL
STG:	P
Content:	PRM UNLEADED
Number Of Tanks:	1

A7 **MUSD - TRANSPORTATION** **RCRA NonGen / NLR** **1024811628**
WNW **26301 GARBANI RD** **CAL000295904**
1/8-1/4 **MENIFEE, CA 92584**
0.235 mi.
1242 ft. **Site 6 of 6 in cluster A**

Relative: **Lower**

Actual: **1518 ft.**

RCRA NonGen / NLR:

Date Form Received by Agency:		2005-06-30 00:00:00.0
Handler Name:	MUSD - TRANSPORTATION	
Handler Address:		26301 GARBANI RD
Handler City,State,Zip:		MENIFEE, CA 92584
EPA ID:		CAL000295904
Contact Name:		JIM SELLERS
Contact Address:		26301 GARBANI RD
Contact City,State,Zip:		MENIFEE, CA 92584
Contact Telephone:		951-679-8896
Contact Fax:		000-000-0000
Contact Email:		JSELLERS@MENIFEEUSD.ORG
Contact Title:		Not reported
EPA Region:		09
Land Type:		Not reported
Federal Waste Generator Description:		Not a generator, verified
Non-Notifier:		Not reported
Biennial Report Cycle:		Not reported
Accessibility:		Not reported
Active Site Indicator:		Handler Activities
State District Owner:		Not reported
State District:		Not reported
Mailing Address:		29775 HAUN RD
Mailing City,State,Zip:		MENIFEE, CA 92584-0000
Owner Name:		MENIFEE UNION SCHOOL DISTRICT
Owner Type:		Other
Operator Name:		JIM SELLERS
Operator Type:		Other
Short-Term Generator Activity:		No
Importer Activity:		No
Mixed Waste Generator:		No
Transporter Activity:		No
Transfer Facility Activity:		No
Recycler Activity with Storage:		No
Small Quantity On-Site Burner Exemption:		No
Smelting Melting and Refining Furnace Exemption:		No
Underground Injection Control:		No
Off-Site Waste Receipt:		No
Universal Waste Indicator:		Yes
Universal Waste Destination Facility:		Yes
Federal Universal Waste:		No
Active Site Fed-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site Converter Treatment storage and Disposal Facility:		Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site State-Reg Handler:		---
Federal Facility Indicator:		Not reported
Hazardous Secondary Material Indicator:		N
Sub-Part K Indicator:		Not reported
Commercial TSD Indicator:		No
Treatment Storage and Disposal Type:		Not reported
2018 GPRA Permit Baseline:		Not on the Baseline
2018 GPRA Renewals Baseline:		Not on the Baseline
Permit Renewals Workload Universe:		Not reported

MUSD - TRANSPORTATION (Continued) **1024811628**

Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	2018-09-05 20:27:27.0
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Operator
Owner/Operator Name:	JIM SELLERS
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	26301 GARBANI RD
Owner/Operator City,State,Zip:	MENIFEE, CA 92584
Owner/Operator Telephone:	951-679-8896
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name:	MENIFEE UNION SCHOOL DISTRICT
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	29775 HAUN RD
Owner/Operator City,State,Zip:	MENIFEE, CA 92584-0000
Owner/Operator Telephone:	951-672-1851
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

MUSD - TRANSPORTATION (Continued) **1024811628**

Historic Generators:
Receive Date: 2005-06-30 00:00:00.0
Handler Name: MUSD - TRANSPORTATION
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 61111
NAICS Description: ELEMENTARY AND SECONDARY SCHOOLS

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

B8 **GTE MURRIETA PLANT YARD** **LUST** **S101590033**
ESE **32477 HAUN RD** **SWEEPS UST** **N/A**
1/4-1/2 **MURRIETA, CA 92362** **CA FID UST**
0.498 mi. **HIST CORTESE**
2632 ft. **Site 1 of 2 in cluster B**

Relative: **Lower**
Actual: **1499 ft.**

LUST REG 8:
Name: GTE MURRIETA PLANT YARD
Address: 32477 HUAN RD
City: MURRIETA
Region: 8
County: Riverside
Regional Board: Santa Ana Region
Facility Status: Case Closed
Case Number: 083303193T
Local Case Num: Not reported
Case Type: Soil only
Substance: Gasoline
Qty Leaked: Not reported
Abate Method: Excavate and Dispose - remove contaminated soil and dispose in approved site
Cross Street: Not reported
Enf Type: CLOS
Funding: Not reported
How Discovered: Not reported
How Stopped: Not reported
Leak Cause: Not reported
Leak Source: Not reported
Global ID: T0606500529
How Stopped Date: Not reported
Enter Date: 7/10/1998

GTE MURRIETA PLANT YARD (Continued) **S101590033**

Date Confirmation of Leak Began:	Not reported
Date Preliminary Assessment Began:	Not reported
Discover Date:	11/18/1997
Enforcement Date:	Not reported
Close Date:	7/14/1999
Date Prelim Assessment Workplan Submitted:	9/22/1997
Date Pollution Characterization Began:	Not reported
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	7/10/1998
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.553886
Longitude:	-117.213921
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	3
Max MTBE Soil:	Not reported
MTBE Fuel:	1
MTBE Tested:	MTBE Detected. Site tested for MTBE & MTBE detected
MTBE Class:	*
Staff:	NOM
Staff Initials:	UNK
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	TEMECULA VALLEY (9-5
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: TANKS REMOVED.

SWEEPS UST:

Name:	GTE MURRIETA PLANT YARD
Address:	32477 HAUN RD
City:	MURRIETA
Status:	Active
Comp Number:	67035
Number:	1
Board Of Equalization:	44-018497
Referral Date:	10-29-92
Action Date:	10-29-92
Created Date:	02-16-89
Owner Tank Id:	000126
SWRCB Tank Id:	33-000-067035-000001
Tank Status:	A
Capacity:	12000
Active Date:	10-29-92
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	6

GTE MURRIETA PLANT YARD (Continued) **S101590033**

Name:	GTE MURRIETA PLANT YARD
Address:	32477 HAUN RD
City:	MURRIETA
Status:	Active
Comp Number:	67035
Number:	1
Board Of Equalization:	44-018497
Referral Date:	10-29-92
Action Date:	10-29-92
Created Date:	02-16-89
Owner Tank Id:	000126
SWRCB Tank Id:	33-000-067035-000002
Tank Status:	A
Capacity:	12000
Active Date:	10-29-92
Tank Use:	M.V. FUEL
STG:	P
Content:	DIESEL
Number Of Tanks:	Not reported

Name:	GTE MURRIETA PLANT YARD
Address:	32477 HAUN RD
City:	MURRIETA
Status:	Active
Comp Number:	67035
Number:	1
Board Of Equalization:	44-018497
Referral Date:	10-29-92
Action Date:	10-29-92
Created Date:	02-16-89
Owner Tank Id:	000126
SWRCB Tank Id:	33-000-067035-000003
Tank Status:	A
Capacity:	500
Active Date:	10-29-92
Tank Use:	OIL
STG:	W
Content:	WASTE OIL
Number Of Tanks:	Not reported

Name:	GTE MURRIETA PLANT YARD
Address:	32477 HAUN RD
City:	MURRIETA
Status:	Active
Comp Number:	67035
Number:	1
Board Of Equalization:	44-018497
Referral Date:	10-29-92
Action Date:	10-29-92
Created Date:	02-16-89
Owner Tank Id:	000126
SWRCB Tank Id:	33-000-067035-000004
Tank Status:	A
Capacity:	350
Active Date:	10-29-92
Tank Use:	HAZARDOUS
STG:	P

GTE MURRIETA PLANT YARD (Continued) **S101590033**

Content: ANTI-FREEZE
Number Of Tanks: Not reported

Name: GTE MURRIETA PLANT YARD
Address: 32477 HAUN RD
City: MURRIETA
Status: Active
Comp Number: 67035
Number: 1
Board Of Equalization: 44-018497
Referral Date: 10-29-92
Action Date: 10-29-92
Created Date: 02-16-89
Owner Tank Id: 000126
SWRCB Tank Id: 33-000-067035-000005
Tank Status: A
Capacity: 350
Active Date: 10-29-92
Tank Use: CHEMICAL
STG: P
Content: SAFETY CLEAN
Number Of Tanks: Not reported

Name: GTE MURRIETA PLANT YARD
Address: 32477 HAUN RD
City: MURRIETA
Status: Active
Comp Number: 67035
Number: 1
Board Of Equalization: 44-018497
Referral Date: 10-29-92
Action Date: 10-29-92
Created Date: 02-16-89
Owner Tank Id: 000126
SWRCB Tank Id: 33-000-067035-000006
Tank Status: A
Capacity: 350
Active Date: 10-29-92
Tank Use: UNKNOWN
STG: W
Content: Not reported
Number Of Tanks: Not reported

CA FID UST:
Facility ID: 33002644
Regulated By: UTNKA
Regulated ID: Not reported
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 7146276261
Mail To: Not reported
Mailing Address: P O BOX 725
Mailing Address 2: Not reported
Mailing City,St,Zip: MURRIETA 92362
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported

GTE MURRIETA PLANT YARD (Continued) **S101590033**

NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

HIST CORTESE:
edr_fname: GTE MURRIETA PLANT YARD
edr_fadd1: 32477
City,State,Zip: MURRIETA, CA
Region: CORTESE
Facility County Code: 33
Reg By: LTNKA
Reg Id: 083303193T

B9 **GTE-MURRIETA PLANT YARD** **LUST** **S103821084**
ESE **32477 HAUN RD** **Cortese** **N/A**
1/4-1/2 **MURRIETA, CA** **CERS**
0.499 mi.
2636 ft. **Site 2 of 2 in cluster B**

Relative:
Lower

Actual:
1499 ft.

LUST:
Name: GTE-MURRIETA PLANT YARD
Address: 32477 HAUN RD
City,State,Zip: MURRIETA, CA
Lead Agency: RIVERSIDE COUNTY LOP
Case Type: LUST Cleanup Site
Geo Track: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606500529
Global Id: T0606500529
Latitude: 33.6496887109401
Longitude: -117.176332543655
Status: Completed - Case Closed
Status Date: 11/30/1999
Case Worker: SCB
RB Case Number: 083303193T
Local Agency: RIVERSIDE COUNTY LOP
File Location: Local Agency Warehouse
Local Case Number: 971216
Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Gasoline
Site History: Not reported

LUST:
Global Id: T0606500529
Contact Type: Local Agency Caseworker
Contact Name: SHARON BOLTINGHOUSE
Organization Name: RIVERSIDE COUNTY LOP
Address: 3880 LEMON ST SUITE 200
City: RIVERSIDE
Email: sbolting@rivco.org
Phone Number: 9519558980

LUST:
Global Id: T0606500529
Action Type: RESPONSE
Date: 08/20/1998
Action: Soil and Water Investigation Report

GTE-MURRIETA PLANT YARD (Continued) **S103821084**

Global Id: T0606500529
Action Type: RESPONSE
Date: 03/05/1998
Action: Tank Removal Report / UST Sampling Report

Global Id: T0606500529
Action Type: RESPONSE
Date: 12/04/1997
Action: Unauthorized Release Form

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 11/29/1999
Action: File review - #RCDEH Upload Site File 5/15/2016

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 07/13/1999
Action: Technical Correspondence / Assistance / Other

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 05/07/1998
Action: Meeting

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 08/20/1998
Action: File review

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 11/30/1999
Action: Closure/No Further Action Letter - #RCDEH113099

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 03/05/1998
Action: * No Action

Global Id: T0606500529
Action Type: ENFORCEMENT
Date: 03/16/1998
Action: Notice of Responsibility

Global Id: T0606500529
Action Type: Other
Date: 11/18/1997
Action: Leak Discovery

Global Id: T0606500529
Action Type: Other
Date: 12/04/1997
Action: Leak Reported

Global Id: T0606500529
Action Type: REMEDIATION

GTE-MURRIETA PLANT YARD (Continued) **S103821084**

Date: 06/24/1997
Action: Excavation

LUST:
Global Id: T0606500529
Status: Open - Case Begin Date
Status Date: 11/18/1997

Global Id: T0606500529
Status: Open - Site Assessment
Status Date: 12/04/1997

Global Id: T0606500529
Status: Open - Site Assessment
Status Date: 05/14/1998

Global Id: T0606500529
Status: Completed - Case Closed
Status Date: 11/30/1999

RIVERSIDE CO. LUST:
Name: GTE-MURRIETA PLANT YARD
Address: 32477 HAUN RD
City,State,Zip: MURRIETA, CA
Region: RIVERSIDE
Facility ID: 971216
Employee: Malloy
Site Closed: Yes
Case Type: Drinking Water Aquifer affected
Facility Status: closed/action completed
Casetype Decode: An Aquifer used for Drinking Water supply has been contaminated.
Fstatus Decode: Closed/Action completed

CORTESE:
Name: GTE-MURRIETA PLANT YARD
Address: 32477 HAUN RD
City,State,Zip: MURRIETA, CA
Region: CORTESE
Envirostor Id: Not reported
Global ID: T0606500529
Site/Facility Type: LUST CLEANUP SITE
Cleanup Status: COMPLETED - CASE CLOSED
Status Date: Not reported
Site Code: Not reported
Latitude: Not reported
Longitude: Not reported
Owner: Not reported
Enf Type: Not reported
Swat R: Not reported
Flag: active
Order No: Not reported
Waste Discharge System No: Not reported
Effective Date: Not reported
Region 2: Not reported
WID Id: Not reported

GTE-MURRIETA PLANT YARD (Continued) **S103821084**

Solid Waste Id No: Not reported
Waste Management Uit Name: Not reported
File Name: Active Open

CERS:
Name: GTE-MURRIETA PLANT YARD
Address: 32477 HAUN RD
City,State,Zip: MURRIETA, CA
Site ID: 188178
CERS ID: T0606500529
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Local Agency Caseworker
Entity Name: SHARON BOLTINGHOUSE - RIVERSIDE COUNTY LOP
Entity Title: Not reported
Affiliation Address: 3880 LEMON ST SUITE 200
Affiliation City: RIVERSIDE
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: 9519558980

10
North
1/2-1
0.561 mi.
2962 ft.

PERRIS UNION HIGH SCH/PALOMA VALLEY SITE **ENVIROSTOR** **S118756757**
31375 BRADLEY ROAD **SCH** **N/A**
PERRIS, CA 92571 **CERS**

Relative:
Lower

Actual:
1475 ft.

ENVIROSTOR:
Name: PERRIS UNION HIGH SCH/PALOMA VALLEY SITE
Address: 31375 BRADLEY ROAD
City,State,Zip: PERRIS, CA 92571
Facility ID: 33880002
Status: No Action Required
Status Date: 06/23/2000
Site Code: 404107
Site Type: School Investigation
Site Type Detailed: School
Acres: 56.53
NPL: NO
Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: Javier Hinojosa
Division Branch: Southern California Schools & Brownfields Outreach
Assembly: 67
Senate: 23
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: School District
Latitude: 33.6641
Longitude: -117.1892
APN: NONE SPECIFIED
Past Use: NONE
Potential COC: NONE SPECIFIED No Contaminants found

PERRIS UNION HIGH SCH/PALOMA VALLEY SITE (Continued) **S118756757**

Confirmed COC: NONE SPECIFIED
Potential Description: NMA
Alias Name: PERRIS UNION HIGH SCH/PALOMA VALLEY SITE
Alias Type: Alternate Name
Alias Name: 404107
Alias Type: Project Code (Site Code)
Alias Name: 33880002
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 06/23/2000
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

SCH:

Name: PERRIS UNION HIGH SCH/PALOMA VALLEY SITE
Address: 31375 BRADLEY ROAD
City,State,Zip: PERRIS, CA 92571
Facility ID: 33880002
Site Type: School Investigation
Site Type Detail: School
Site Mgmt. Req.: NONE SPECIFIED
Acres: 56.53
National Priorities List: NO
Cleanup Oversight Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Lead Agency Description: Not reported
Project Manager: Not reported
Supervisor: Javier Hinojosa
Division Branch: Southern California Schools & Brownfields Outreach
Site Code: 404107
Assembly: 67
Senate: 23
Special Program Status: Not reported
Status: No Action Required
Status Date: 06/23/2000
Restricted Use: NO
Funding: School District
Latitude: 33.6641
Longitude: -117.1892
APN: NONE SPECIFIED
Past Use: NONE
Potential COC: NONE SPECIFIED, No Contaminants found
Confirmed COC: NONE SPECIFIED

PERRIS UNION HIGH SCH/PALOMA VALLEY SITE (Continued) **S118756757**

Potential Description: NMA
Alias Name: PERRIS UNION HIGH SCH/PALOMA VALLEY SITE
Alias Type: Alternate Name
Alias Name: 404107
Alias Type: Project Code (Site Code)
Alias Name: 33880002
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 06/23/2000
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

CERS:
Name: PERRIS UNION HIGH SC
Address: 31375 BRADLEY ROAD
City,State,Zip: PERRIS, CA 92571
Site ID: 371480
CERS ID: 33880002
CERS Description: School Investigation

Affiliation:
Affiliation Type Desc: Supervisor
Entity Name: JAVIER HINOJOSA
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

11
NNW
1/2-1
0.643 mi.
3394 ft.

PALOMA HIGH SCHOOL EXPANSION **ENVIROSTOR** **S118757364**
31375 BRADLEY ROAD **SCH** **N/A**
MENIFEE, CA 92584

Relative:
Lower

Actual:
1474 ft.

ENVIROSTOR:
Name: PALOMA HIGH SCHOOL EXPANSION
Address: 31375 BRADLEY ROAD
City,State,Zip: MENIFEE, CA 92584
Facility ID: 70000072
Status: No Action Required
Status Date: 06/01/2006

PALOMA HIGH SCHOOL EXPANSION (Continued) **S118757364**

Site Code: 404657
Site Type: School Investigation
Site Type Detailed: School
Acres: 56.5
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Amit Pathak
Supervisor: Shahir Haddad
Division Branch: Southern California Schools & Brownfields Outreach
Assembly: 67
Senate: 23
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: School District
Latitude: 33.6653
Longitude: -117.1912
APN: NONE SPECIFIED
Past Use: AGRICULTURAL - ROW CROPS, SCHOOL - OTHER
Potential COC: Arsenic Chlordane Total Chromium (1:6 ratio Cr VI:Cr III DDD DDE DDT Endrin Lead Toxaphene
Confirmed COC: 30001-NO 30004-NO 30005-NO 30006-NO 30007-NO 30008-NO 30010-NO 30013-NO 30023-NO
Potential Description: NMA
Alias Name: 404657
Alias Type: Project Code (Site Code)
Alias Name: 70000072
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 12/13/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 11/04/2005
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

SCH:

Name: PALOMA HIGH SCHOOL EXPANSION
Address: 31375 BRADLEY ROAD

PALOMA HIGH SCHOOL EXPANSION (Continued) **S118757364**

City,State,Zip:	MENIFEE, CA 92584
Facility ID:	70000072
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	56.5
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Amit Pathak
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Site Code:	404657
Assembly:	67
Senate:	23
Special Program Status:	Not reported
Status:	No Action Required
Status Date:	06/01/2006
Restricted Use:	NO
Funding:	School District
Latitude:	33.6653
Longitude:	-117.1912
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS, SCHOOL - OTHER
Potential COC:	Arsenic, Chlordane, Total Chromium (1:6 ratio Cr VI:Cr III, DDD, DDE, DDT, Endrin, Lead, Toxaphene
Confirmed COC:	30001-NO, 30004-NO, 30005-NO, 30006-NO, 30007-NO, 30008-NO, 30010-NO, 30013-NO, 30023-NO
Potential Description:	NMA
Alias Name:	404657
Alias Type:	Project Code (Site Code)
Alias Name:	70000072
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	12/13/2005
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Phase 1
Completed Date:	11/04/2005
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

Count: 4 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MENIFEE	S126330261	PROPOSED ELEMENTARY SCHOOL NO. 15	BRIGGS ROAD/WICKERD ROAD	92584	ENVIROSTOR, SCH
MENIFEE	S107538090		CLUB AVE 0.3 MI N OF BUNDY CAN		CDL
MENIFEE	S107526621		1/4 MI E OF MURRIETA RD ON COR	92584	CDL
RIVERSIDE COUNTY	S107541240		WINEVILLE, SW CORNER OF GAGELE		CDL

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 03/30/2021
Date Made Active in Reports: 06/17/2021
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 06/23/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/21/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/21/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/21/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/21/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/21/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/09/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 39

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/05/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 02/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 02/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/24/2021
Date Made Active in Reports: 06/17/2021
Number of Days to Update: 85

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 04/23/2021
Date Data Arrived at EDR: 04/23/2021
Date Made Active in Reports: 07/12/2021
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/22/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 04/23/2021
Date Data Arrived at EDR: 04/23/2021
Date Made Active in Reports: 07/12/2021
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/22/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/10/2021
Date Data Arrived at EDR: 05/11/2021
Date Made Active in Reports: 07/27/2021
Number of Days to Update: 77

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 05/11/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/29/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Varies

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 03/05/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 04/01/2021
Number of Days to Update: 23
Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69
Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 06/08/2021
Next Scheduled EDR Contact: 09/27/2021
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86
Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 06/11/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 06/15/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: No Update Planned

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 04/23/2021
Date Data Arrived at EDR: 04/23/2021
Date Made Active in Reports: 07/12/2021
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/22/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Quarterly

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: No Update Planned

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing

A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 06/10/2021
Number of Days to Update: 79

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 03/15/2021
Date Data Arrived at EDR: 03/16/2021
Date Made Active in Reports: 06/10/2021
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/10/2021
Next Scheduled EDR Contact: 09/27/2021
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 07/20/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 03/09/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 11/23/2020
Date Data Arrived at EDR: 11/23/2020
Date Made Active in Reports: 02/08/2021
Number of Days to Update: 77

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 06/15/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 07/20/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 07/20/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/22/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 04/23/2021
Date Data Arrived at EDR: 04/23/2021
Date Made Active in Reports: 07/12/2021
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/22/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 01/20/2021
Date Made Active in Reports: 04/08/2021
Number of Days to Update: 78

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 04/19/2021
Date Data Arrived at EDR: 04/20/2021
Date Made Active in Reports: 07/07/2021
Number of Days to Update: 78

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 07/15/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Quarterly

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 02/24/2021
Date Data Arrived at EDR: 02/24/2021
Date Made Active in Reports: 05/14/2021
Number of Days to Update: 79

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/07/2021
Date Made Active in Reports: 07/23/2021
Number of Days to Update: 77

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 07/27/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CERS TANKS: California Environmental Reporting System (CERS) Tanks

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 04/19/2021
Date Data Arrived at EDR: 04/20/2021
Date Made Active in Reports: 07/07/2021
Number of Days to Update: 78

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 07/15/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Quarterly

Local Land Records

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 78

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 03/02/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 77

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 05/28/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/24/2021
Date Made Active in Reports: 06/17/2021
Number of Days to Update: 85

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 04/04/2021
Date Data Arrived at EDR: 04/20/2021
Date Made Active in Reports: 07/07/2021
Number of Days to Update: 78

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/15/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/21/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 47

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 07/09/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 06/17/2021
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 06/21/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 07/26/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: No Update Planned

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/07/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/17/2020
Date Made Active in Reports: 09/10/2020
Number of Days to Update: 85

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 09/27/2021
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 08/14/2020
Date Made Active in Reports: 11/04/2020
Number of Days to Update: 82

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/17/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 04/19/2021
Date Data Arrived at EDR: 04/20/2021
Date Made Active in Reports: 07/16/2021
Number of Days to Update: 87

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/19/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 01/22/2021
Date Data Arrived at EDR: 02/18/2021
Date Made Active in Reports: 05/11/2021
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 07/14/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 03/05/2021
Number of Days to Update: 50

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/19/2020
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 07/09/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: No Update Planned

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/11/2021
Date Made Active in Reports: 05/11/2021
Number of Days to Update: 61

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 07/14/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 70

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 05/07/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 06/22/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: No Update Planned

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80
Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 07/23/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2021
Date Data Arrived at EDR: 07/14/2021
Date Made Active in Reports: 07/16/2021
Number of Days to Update: 2

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 07/02/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/22/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 151

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 06/21/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 07/02/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Varies

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 07/23/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: No Update Planned

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: No Update Planned

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 05/27/2021
Date Data Arrived at EDR: 05/27/2021
Date Made Active in Reports: 06/10/2021
Number of Days to Update: 14

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 07/01/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/01/2021
Date Data Arrived at EDR: 02/24/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 84

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/23/2021
Date Data Arrived at EDR: 03/25/2021
Date Made Active in Reports: 06/17/2021
Number of Days to Update: 84

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 06/14/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/03/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 33

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/17/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 04/04/2021
Date Data Arrived at EDR: 04/06/2021
Date Made Active in Reports: 06/25/2021
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 07/01/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 07/02/2020
Date Made Active in Reports: 09/17/2020
Number of Days to Update: 77

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 07/07/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/17/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 06/10/2021
Number of Days to Update: 79

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 02/23/2021
Date Data Arrived at EDR: 02/25/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 83

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 02/26/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/04/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 77

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 06/16/2020
Date Made Active in Reports: 08/28/2020
Number of Days to Update: 73

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 06/10/2021
Next Scheduled EDR Contact: 09/27/2021
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 04/16/2021
Date Data Arrived at EDR: 04/20/2021
Date Made Active in Reports: 07/07/2021
Number of Days to Update: 78

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 07/15/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 04/14/2021
Date Data Arrived at EDR: 04/15/2021
Date Made Active in Reports: 07/06/2021
Number of Days to Update: 82

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/13/2021
Date Data Arrived at EDR: 05/13/2021
Date Made Active in Reports: 07/26/2021
Number of Days to Update: 74

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 05/05/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 04/15/2020
Date Made Active in Reports: 07/02/2020
Number of Days to Update: 78

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 07/09/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Annually

ICE: ICE
Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 05/14/2021
Date Data Arrived at EDR: 05/14/2021
Date Made Active in Reports: 07/27/2021
Number of Days to Update: 74
Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 05/14/2021
Date Data Arrived at EDR: 05/14/2021
Date Made Active in Reports: 07/27/2021
Number of Days to Update: 74
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 04/05/2021
Date Data Arrived at EDR: 04/06/2021
Date Made Active in Reports: 06/23/2021
Number of Days to Update: 78
Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 07/01/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 01/29/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 78
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 05/28/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 05/10/2021
Date Data Arrived at EDR: 05/11/2021
Date Made Active in Reports: 07/27/2021
Number of Days to Update: 77
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 05/11/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 03/02/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 78
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 05/28/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 03/09/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 03/12/2021
Date Data Arrived at EDR: 03/16/2021
Date Made Active in Reports: 06/01/2021
Number of Days to Update: 77
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 06/08/2021
Next Scheduled EDR Contact: 09/27/2021
Data Release Frequency: No Update Planned

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 11/19/2019
Date Data Arrived at EDR: 01/07/2020
Date Made Active in Reports: 03/09/2020
Number of Days to Update: 62

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 07/01/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 06/15/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing
In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 03/09/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 06/07/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System
The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 11/30/2020
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 02/12/2021
Number of Days to Update: 73
Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 05/19/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 04/19/2021
Date Data Arrived at EDR: 04/20/2021
Date Made Active in Reports: 07/07/2021
Number of Days to Update: 78
Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 07/15/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)

Produced water ponds sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)

Sampling point - public sites

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)

Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/30/2021
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

HWTS: Hazardous Waste Tracking System
DTSC maintains the Hazardous Waste Tracking System that stores ID number information since the early 1980s and manifest data since 1993. The system collects both manifest copies from the generator and destination facility.

Date of Government Version: 04/08/2021
Date Data Arrived at EDR: 04/09/2021
Date Made Active in Reports: 04/20/2021
Number of Days to Update: 11

Source: Department of Toxic Substances Control
Telephone: 916-324-2444
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Varies

PCS: Permit Compliance System
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 06/30/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: No Update Planned

PCS INACTIVE: Listing of Inactive PCS Permits
An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 11/05/2014
Date Data Arrived at EDR: 01/06/2015
Date Made Active in Reports: 05/06/2015
Number of Days to Update: 120

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 06/30/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: No Update Planned

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 06/30/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: No Update Planned

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites
A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks
Underground storage tank sites located in Alameda county.

Date of Government Version: 03/17/2021
Date Data Arrived at EDR: 03/18/2021
Date Made Active in Reports: 03/25/2021
Number of Days to Update: 7

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 02/02/2021
Date Data Arrived at EDR: 02/04/2021
Date Made Active in Reports: 04/23/2021
Number of Days to Update: 78

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 07/26/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 06/15/2021
Date Data Arrived at EDR: 06/16/2021
Date Made Active in Reports: 07/02/2021
Number of Days to Update: 16

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 06/15/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/06/2020
Date Data Arrived at EDR: 04/23/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 78

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 07/26/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 04/21/2021
Date Data Arrived at EDR: 04/22/2021
Date Made Active in Reports: 07/12/2021
Number of Days to Update: 81

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 07/20/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 12/17/2020
Date Data Arrived at EDR: 01/28/2021
Date Made Active in Reports: 04/16/2021
Number of Days to Update: 78

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/20/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 05/10/2021
Date Data Arrived at EDR: 05/12/2021
Date Made Active in Reports: 07/26/2021
Number of Days to Update: 75

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 07/20/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 01/14/2021
Date Data Arrived at EDR: 01/15/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 80

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 06/23/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 05/17/2021
Date Data Arrived at EDR: 05/18/2021
Date Made Active in Reports: 05/20/2021
Number of Days to Update: 2

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 05/10/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/14/2021
Date Data Arrived at EDR: 04/15/2021
Date Made Active in Reports: 07/06/2021
Number of Days to Update: 82

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 05/11/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

KERN COUNTY:

CUPA KERN: CUPA Facility List
A listing of sites included in the Kern County Hazardous Material Business Plan.

Date of Government Version: 04/22/2021
Date Data Arrived at EDR: 04/30/2021
Date Made Active in Reports: 07/19/2021
Number of Days to Update: 80

Source: Kern County Public Health
Telephone: 661-321-3000
Last EDR Contact: 07/26/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Varies

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 01/19/2021
Date Data Arrived at EDR: 01/21/2021
Date Made Active in Reports: 01/28/2021
Number of Days to Update: 7

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 07/26/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 12/03/2020
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/14/2021
Number of Days to Update: 78

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List

Cupa facility list

Date of Government Version: 05/10/2021
Date Data Arrived at EDR: 05/12/2021
Date Made Active in Reports: 07/26/2021
Number of Days to Update: 75

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 07/06/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List

Cupa facility list

Date of Government Version: 07/31/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 80

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 06/08/2021
Next Scheduled EDR Contact: 09/27/2021
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 04/08/2021
Date Data Arrived at EDR: 04/13/2021
Date Made Active in Reports: 06/28/2021
Number of Days to Update: 76

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 06/29/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/12/2021
Date Data Arrived at EDR: 04/13/2021
Date Made Active in Reports: 06/28/2021
Number of Days to Update: 76

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 07/09/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2021
Date Data Arrived at EDR: 02/18/2021
Date Made Active in Reports: 05/10/2021
Number of Days to Update: 81

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/06/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills
This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 02/04/2021
Date Data Arrived at EDR: 04/16/2021
Date Made Active in Reports: 04/21/2021
Number of Days to Update: 5

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 07/12/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory
A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 04/19/2021
Date Data Arrived at EDR: 06/17/2021
Date Made Active in Reports: 06/28/2021
Number of Days to Update: 11

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory
A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/17/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 03/02/2021
Date Data Arrived at EDR: 04/16/2021
Date Made Active in Reports: 07/06/2021
Number of Days to Update: 81
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 07/09/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 07/06/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65
Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 02/02/2021
Date Data Arrived at EDR: 04/28/2021
Date Made Active in Reports: 07/13/2021
Number of Days to Update: 76
Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 72
Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 06/22/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: No Update Planned

MENDOCINO COUNTY:

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 03/24/2021
Date Data Arrived at EDR: 04/07/2021
Date Made Active in Reports: 06/24/2021
Number of Days to Update: 78

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 05/13/2021
Date Data Arrived at EDR: 05/14/2021
Date Made Active in Reports: 07/26/2021
Number of Days to Update: 73

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 06/02/2021
Next Scheduled EDR Contact: 09/06/3021
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 06/23/2021
Date Data Arrived at EDR: 06/23/2021
Date Made Active in Reports: 06/24/2021
Number of Days to Update: 1

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 06/22/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Varies

NAPA COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 09/05/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 10/31/2019
Number of Days to Update: 52

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 04/28/2021
Date Data Arrived at EDR: 04/29/2021
Date Made Active in Reports: 07/15/2021
Number of Days to Update: 77

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/20/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 04/30/2021
Date Made Active in Reports: 07/19/2021
Number of Days to Update: 80

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 04/29/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/12/2021
Number of Days to Update: 9

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 04/29/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 04/29/2021
Date Data Arrived at EDR: 04/30/2021
Date Made Active in Reports: 07/19/2021
Number of Days to Update: 80

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 04/30/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 05/25/2021
Date Data Arrived at EDR: 05/26/2021
Date Made Active in Reports: 06/01/2021
Number of Days to Update: 6
Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64
Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 06/29/2021
Date Data Arrived at EDR: 06/30/2021
Date Made Active in Reports: 07/14/2021
Number of Days to Update: 14
Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/08/2021
Next Scheduled EDR Contact: 09/27/2021
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 06/29/2021
Date Data Arrived at EDR: 06/30/2021
Date Made Active in Reports: 07/14/2021
Number of Days to Update: 14
Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/07/2021
Next Scheduled EDR Contact: 09/27/2021
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 03/30/2021
Date Data Arrived at EDR: 04/01/2021
Date Made Active in Reports: 06/23/2021
Number of Days to Update: 83
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/01/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 03/30/2021
Date Data Arrived at EDR: 04/01/2021
Date Made Active in Reports: 06/25/2021
Number of Days to Update: 85
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 06/23/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 04/28/2021
Date Data Arrived at EDR: 04/29/2021
Date Made Active in Reports: 05/03/2021
Number of Days to Update: 4

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 07/26/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 05/19/2021
Date Data Arrived at EDR: 05/19/2021
Date Made Active in Reports: 06/07/2021
Number of Days to Update: 19

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 07/27/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 03/02/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 05/21/2021
Number of Days to Update: 79

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 05/28/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 11/23/2020
Date Made Active in Reports: 02/08/2021
Number of Days to Update: 77

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 07/27/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing
A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/14/2020
Date Data Arrived at EDR: 07/16/2020
Date Made Active in Reports: 09/29/2020
Number of Days to Update: 75

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

CUPA SAN FRANCISCO CO: CUPA Facility Listing
Cupa facilities

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/07/2021
Date Made Active in Reports: 07/23/2021
Number of Days to Update: 77
Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 07/27/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Varies

LUST SAN FRANCISCO: Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 07/27/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/07/2021
Date Made Active in Reports: 07/23/2021
Number of Days to Update: 77
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 07/27/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 06/08/2021
Next Scheduled EDR Contact: 09/27/2021
Data Release Frequency: No Update Planned

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 05/07/2021
Date Data Arrived at EDR: 05/11/2021
Date Made Active in Reports: 05/14/2021
Number of Days to Update: 3
Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 05/06/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 02/20/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 64
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/10/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/02/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: No Update Planned

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28
Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 02/24/2021
Date Data Arrived at EDR: 02/26/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 82
Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22
Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 01/26/2021
Number of Days to Update: 82

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 07/27/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 05/12/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: No Update Planned

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 03/23/2021
Date Data Arrived at EDR: 03/25/2021
Date Made Active in Reports: 06/10/2021
Number of Days to Update: 77

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/22/2021
Next Scheduled EDR Contact: 09/12/2021
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 07/02/2021
Date Data Arrived at EDR: 07/06/2021
Date Made Active in Reports: 07/14/2021
Number of Days to Update: 8

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 06/28/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 04/01/2021
Date Data Arrived at EDR: 04/01/2021
Date Made Active in Reports: 06/23/2021
Number of Days to Update: 83

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 06/15/2021
Next Scheduled EDR Contact: 10/04/2021
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 02/09/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 05/05/2021
Number of Days to Update: 83

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 07/06/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 01/13/2021
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 04/06/2021
Number of Days to Update: 82

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 07/27/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 04/14/2021
Date Data Arrived at EDR: 04/15/2021
Date Made Active in Reports: 07/06/2021
Number of Days to Update: 82

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 04/26/2021
Date Data Arrived at EDR: 04/28/2021
Date Made Active in Reports: 07/13/2021
Number of Days to Update: 76

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 07/27/2021
Next Scheduled EDR Contact: 11/15/2021
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 07/13/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 03/29/2021
Date Data Arrived at EDR: 04/22/2021
Date Made Active in Reports: 07/12/2021
Number of Days to Update: 81

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/15/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/22/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/05/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 03/29/2021
Date Data Arrived at EDR: 04/21/2021
Date Made Active in Reports: 04/23/2021
Number of Days to Update: 2

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 07/15/2021
Next Scheduled EDR Contact: 11/01/2021
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 03/31/2021
Number of Days to Update: 22
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 03/26/2021
Date Data Arrived at EDR: 04/01/2021
Date Made Active in Reports: 06/23/2021
Number of Days to Update: 83
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 06/22/2021
Next Scheduled EDR Contact: 10/11/2021
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 04/21/2021
Date Data Arrived at EDR: 04/22/2021
Date Made Active in Reports: 05/12/2021
Number of Days to Update: 20
Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/20/2021
Next Scheduled EDR Contact: 11/08/2021
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 10/05/2020
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 05/10/2021
Number of Days to Update: 82
Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/11/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36
Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/09/2021
Next Scheduled EDR Contact: 10/18/2021
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 04/29/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 72

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 04/30/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 07/07/2021
Next Scheduled EDR Contact: 10/25/2021
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 02/24/2021
Number of Days to Update: 13

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/13/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Annually

Oil/Gas Pipelines

Source: Endeavor Business Media

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data

Source: Endeavor Business Media

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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.
Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

NW OF WICKER R AND ASCOT WAY
NW OF WICKER R AND ASCOT WAY
MENIFEE, CA 92584

TARGET PROPERTY COORDINATES

Latitude (North):	33.652357 - 33° 39' 8.49''
Longitude (West):	117.186516 - 117° 11' 11.46''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	482705.4
UTM Y (Meters):	3723433.5
Elevation:	1559 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5641314 ROMOLAND, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

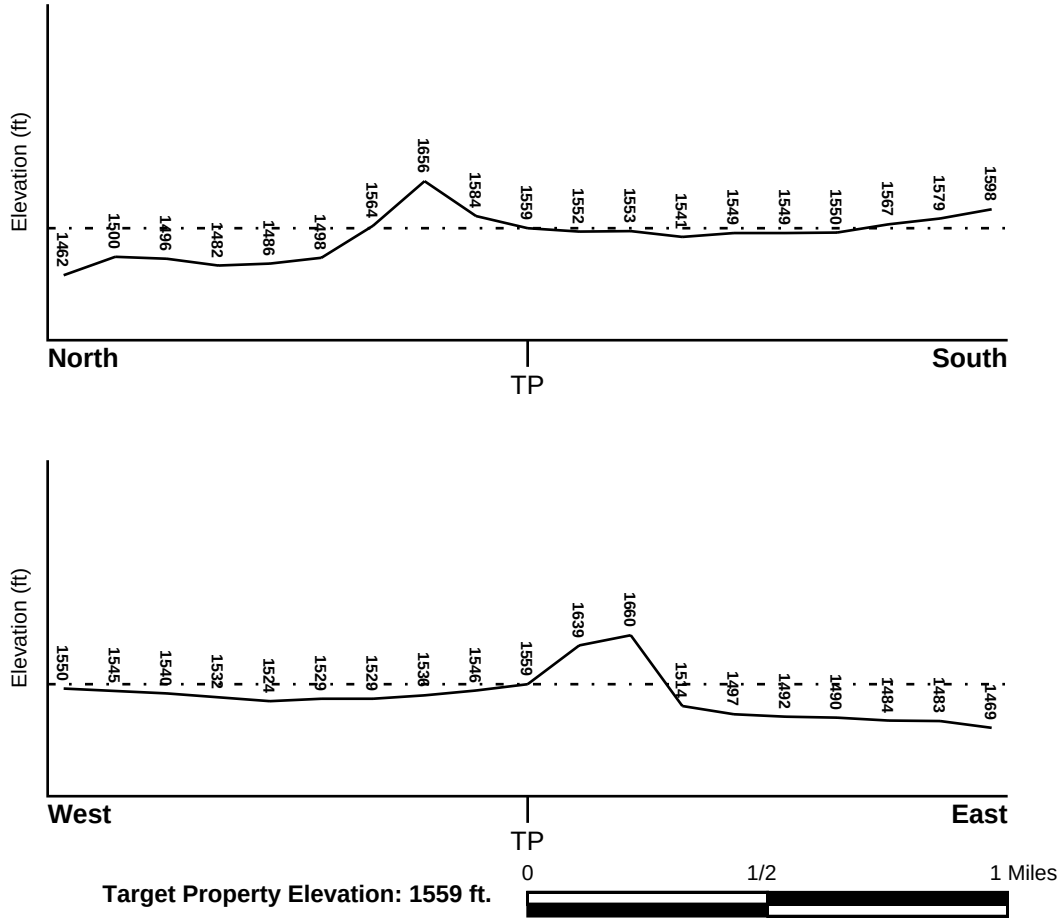
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06065C2070H	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06065C2062G	FEMA FIRM Flood data
0602452090B	FEMA Q3 Flood data
0602452095A	FEMA Q3 Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
4	1/2 - 1 Mile ESE	NNE
1G	1/2 - 1 Mile ESE	NNE

For additional site information, refer to Physical Setting Source Map Findings.

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

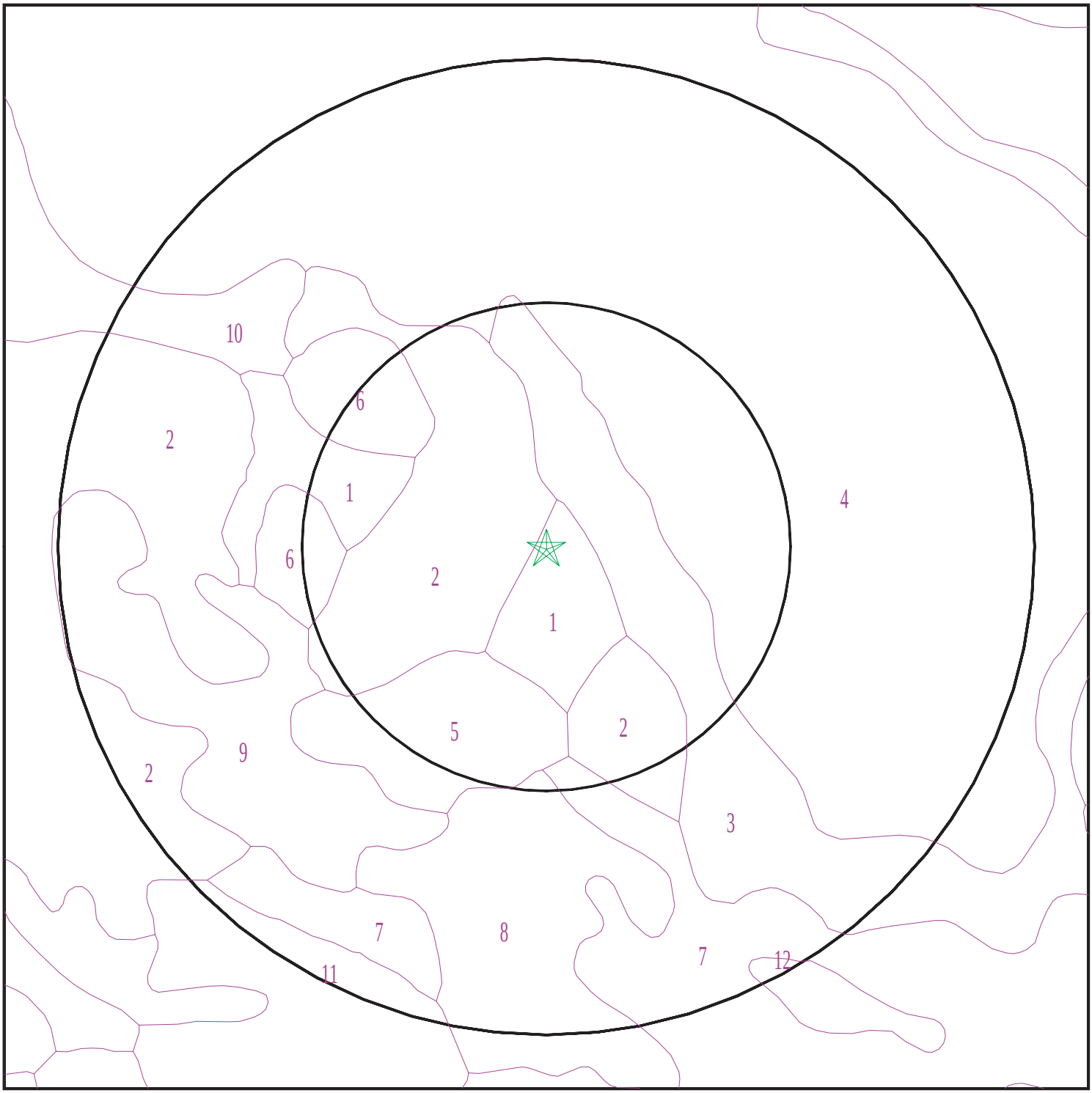
Era:	Mesozoic
System:	Cretaceous
Series:	Cretaceous granitic rocks
Code:	Kg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 06595663.2r



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	NW of Wicker R and Ascot Way	CLIENT:	Hillmann Environmental Co.
ADDRESS:	NW of Wicker R and Ascot Way Menifee CA 92584	CONTACT:	Shilpa Sunil
		INQUIRY #:	06595663.2r
LAT/LONG:	33.652357 / 117.186516	DATE:	July 28, 2021 9:11 am

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: YOKOHL

Soil Surface Texture: loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6
2	9 inches	25 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6
3	25 inches	29 inches	indurated	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	29 inches	59 inches	stratified sandy loam to gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6

Soil Map ID: 2

Soil Component Name: WYMAN

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6
2	14 inches	35 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	35 inches	50 inches	stratified loam to clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6
4	50 inches	59 inches	stratified loam to clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Map ID: 3

Soil Component Name: LAS POSAS

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	29 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	29 inches	53 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 4

Soil Component Name: LAS POSAS

Soil Surface Texture: stony loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	stony loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	5 inches	20 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	20 inches	24 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 5

Soil Component Name: PORTERVILLE

Soil Surface Texture: clay

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.01	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	7 inches	35 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.01	Max: Min:
3	35 inches	40 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.01	Max: Min:

Soil Map ID: 6

Soil Component Name: LAS POSAS

Soil Surface Texture: stony loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	stony loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	25 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	25 inches	53 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 7

Soil Component Name: CAJALCO

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	12 inches	22 inches	loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	22 inches	61 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 8

Soil Component Name: CAJALCO

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	12 inches	29 inches	loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	29 inches	61 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 9

Soil Component Name: VALLECITOS

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 127 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 4 Min: 1.4	Max: Min:

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	7 inches	27 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 4 Min: 1.4	Max: Min:
3	27 inches	48 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 4 Min: 1.4	Max: Min:
4	48 inches	51 inches	unweathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 4 Min: 1.4	Max: Min:

Soil Map ID: 10

Soil Component Name: HONCUT

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 6.1
2	22 inches	59 inches	coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 6.1

Soil Map ID: 11

Soil Component Name: CAJALCO

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	12 inches	18 inches	loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	18 inches	61 inches	weathered bedrock	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 12

Soil Component Name: LAS POSAS

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	31 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	31 inches	53 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A3	USGS40000136350	1/2 - 1 Mile WSW
B7	USGS40000136292	1/2 - 1 Mile SW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

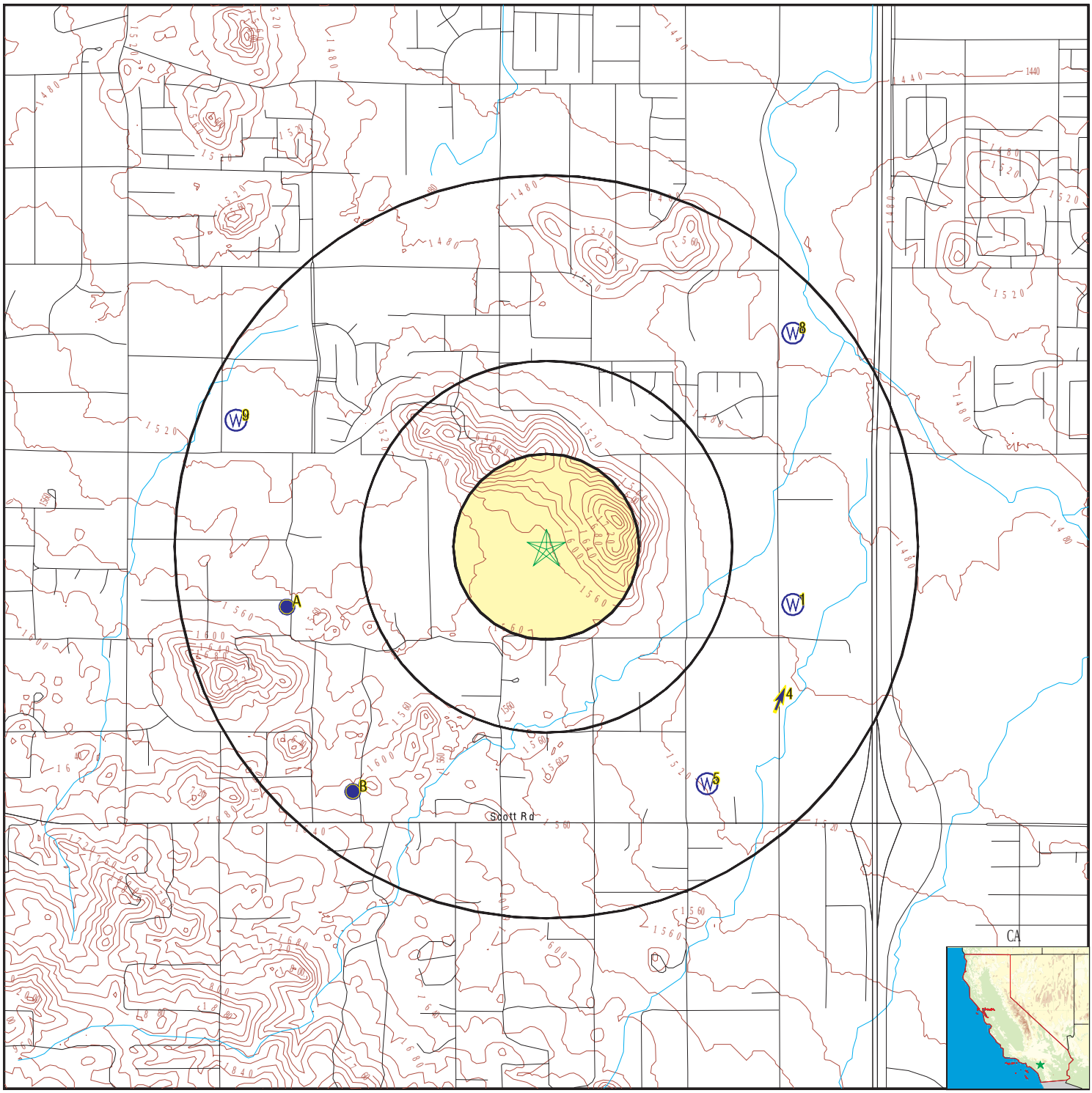
Note: PWS System location is not always the same as well location.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	CADWR0000004428	1/2 - 1 Mile ESE
A2	CAUSGSN00010033	1/2 - 1 Mile WSW
5	CADWR0000015080	1/2 - 1 Mile SE
B6	CAUSGSN00016852	1/2 - 1 Mile SW
8	CADWR0000021968	1/2 - 1 Mile NE
9	CADWR0000027137	1/2 - 1 Mile WNW

PHYSICAL SETTING SOURCE MAP - 06595663.2r



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	NW of Wicker R and Ascot Way	CLIENT:	Hillmann Environmental Co.
ADDRESS:	NW of Wicker R and Ascot Way Menifee CA 92584	CONTACT:	Shilpa Sunil
LAT/LONG:	33.652357 / 117.186516	INQUIRY #:	06595663.2r
		DATE:	July 28, 2021 9:11 am

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
1 **ESE** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CADWR0000004428**

Well ID:	06S03W15J	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	06S03W15J	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=06S03W15J&store_num=		
GeoTracker Data:	Not Reported		

	Database	EDR ID Number
A2 **WSW** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CAUSGSN00010033**

Well ID:	USGS-333900117115201	Well Type:	UNK
Source:	United States Geological Survey		
Other Name:	USGS-333900117115201	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=USGSNEW&samp_date=&global_id=&assigned_name=USGS-333900117115201&store_num=		
GeoTracker Data:	Not Reported		

	Database	EDR ID Number
A3 **WSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000136350**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	006S003W16F001S	Type:	Well
Description:	Not Reported	HUC:	18070202
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	Not Reported
Well Depth:	160	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

			Database	EDR ID Number
4 **ESE** **1/2 - 1 Mile** **Lower**			**AQUIFLOW**	**66385**
	Site ID:	083303193T		
	Groundwater Flow:	NNE		
	Shallow Water Depth:	13.23		
	Deep Water Depth:	17.15		
	Average Water Depth:	Not Reported		
	Date:	03/26/1999		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

5
SE
1/2 - 1 Mile
Lower

CA WELLS **CADWR0000015080**

Well ID:	06S03W22B	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	06S03W22B	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=06S03W22B&store_num=		
GeoTracker Data:	Not Reported		

B6
SW
1/2 - 1 Mile
Higher

CA WELLS **CAUSGSN00016852**

Well ID:	USGS-333834117114101	Well Type:	UNK
Source:	United States Geological Survey		
Other Name:	USGS-333834117114101	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=USGSNEW&samp_date=&global_id=&assigned_name=USGS-333834117114101&store_num=		
GeoTracker Data:	Not Reported		

B7
SW
1/2 - 1 Mile
Higher

FED USGS **USGS40000136292**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	006S003W16Q001S	Type:	Well
Description:	Not Reported	HUC:	18070202
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Other aquifers	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	Not Reported
Well Depth:	Not Reported	Well Depth Units:	Not Reported
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

8
NE
1/2 - 1 Mile
Lower

CA WELLS **CADWR0000021968**

Well ID:	06S03W10R	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	06S03W10R	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=06S03W10R&store_num=		
GeoTracker Data:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

9
WNW
1/2 - 1 Mile
Lower

CA WELLS **CADWR0000027137**

Well ID:	06S03W16C001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	06S03W16C001S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=06S03W16C001S&store_num=		
GeoTracker Data:	Not Reported		

1G
ESE
1/2 - 1 Mile
Lower

AQUIFLOW **66385**

Site ID:	083303193T
Groundwater Flow:	NNE
Shallow Water Depth:	13.23
Deep Water Depth:	17.15
Average Water Depth:	Not Reported
Date:	03/26/1999

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92584	3	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

PHYSICAL SETTING SOURCE RECORDS SEARCHED

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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APPENDIX F

OTHER DOCUMENTS

HILLMANN
CONSULTING

July 28, 2021

South Coast Air Quality Management District
Attn: Public Records
21865 East Copley Drive
Diamond Bar, CA 91765
Phone (909) 396-3700
Fax (909) 396-2961

RE: Environmental Information/Files:

NW corner of Wickerd Road and Ascot Way
APNs: 360300002, -03, -04, -05, -06, -09, 360350001
Menifee, CA 92584

Dear Sir/Madam:

Hillmann Environmental Group, LLC is conducting an environmental investigation of the property located at the above referenced address. Under the Freedom of Information Act, we are requesting any information your office has regarding the above referenced property. Please contact me and let me know whether or not you locate any records. If you locate any records, I would like to either obtain copies or schedule a file review. My office number is (714) 634-9500.

Sincerely,

Alyssa Berry
Environmental Intern
Hillmann Consulting, LLC
aberry@hillmannconsulting.com

HILLMANN
CONSULTING

July 28, 2021

State of California
Regional Water Quality Control Board – Santa Ana Region (8)
3737 Main Street, Suite #500
Riverside, CA 92501-3339
Phone (951) 782-4130
Fax (951) 781-6288
FileReview8@waterboards.ca.gov

RE: Environmental Files:

NW corner of Wickerd Road and Ascot Way
APNs: 360300002, -03, -04, -05, -06, -09, 360350001
Menifee, CA 92584

Dear RWQCB:

Hillmann Consulting, LLC is conducting an environmental investigation of the above referenced property. Under the Freedom of Information Act, we are requesting any information your office has regarding this property. If any records are located, we would like to obtain copies or schedule a file review. If no records are available, please contact me to confirm. Thank you.

Sincerely,

Alyssa Berry
Environmental Intern
Hillmann Consulting, LLC
aberry@hillmanngroup.com

MyProperty Search Results

NO INFORMATION FOUND FOR THE SUBMITTED ADDRESS

No records were found within the EPA's Facility Registry System (FRS) list of address records for the provided search location. The No Records Certificate is a link to a printable document stating that no record(s) were found for the provided search location.

Search Criteria
Address Searched: Wicker Rd
City Searched: Menifee
State Searched: CA

WARNING:
The address entered could not be matched exactly against the EPA's Facility Registry System (FRS) list of address records.
Please make sure you have entered the address correctly for the location you are interested in.

If you would like to utilize additional search tools to investigate areas of interest, please visit the Envirofacts or the Facility Registry System search tools.

Query executed on 07/30/2021 01:03 PM

Disclaimer: The MyProperty reports are provided solely for informational purposes. They do not provide legal advice, have legally binding effect, or expressly or implicitly create, expand, or limit any legal rights, obligations, responsibilities, expectations, or benefits in regard to any person. EPA maintains the application to enhance public access to environmental information. This service has continual data updates, and we will correct errors brought to our attention, as appropriate.

LAST UPDATED ON {MONTH DAY, YYYY}

HILLMANN
CONSULTING

July 28, 2021

City of Riverside - Fire Prevention Department -
Phone (951)826-5737
Prev@riversideca.gov

3085 St. Lawrence Street
Riverside, CA 92504
Phone (951) 826-5321
fire@riversideca.gov

RE: Underground Storage Tank/Hazardous Materials Files:

NW corner of Wickerd Road and Ascot Way
APNs: 360300002, -03, -04, -05, -06, -09, 360350001
Menifee, CA 92584

Dear Sir/Madam:

Hillmann Environmental Group, LLC is conducting an environmental investigation of the above referenced property. Under the Freedom of Information Act, we are requesting any information your office has regarding this property. If any records are located, we would like to obtain copies or schedule a file review. If no records are available, please contact me to confirm. Thank you.

Sincerely,

Alyssa Berry
Environmental Intern
aberry@Hillmannconsulting.com

Jared Blumenfeld
Secretary for
Environmental Protection

Department of Toxic Substances Control

Meredith Williams, Ph.D., Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Gavin Newsom
Governor

August 2, 2021

Alyssa Berry
Hillmann Environmental Group, LLC
aberry@hillmanngroup.com

Public Records Request Number: 1-073021-03
Location(s): NW Corner of Wickerd Road and Ascot Way, Menifee, CA 92584

Dear Requestor:

On July 30, 2021 the Department of Toxic Substances Control (DTSC) received your email of the same date requesting records under the Public Records Act. After a thorough review of our files, no site records were found pertaining to the sites/facilities referenced above.

A large number of our records are available on EnviroStor, an online database that provides non-confidential, public access to DTSCs data management system. It tracks our cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known or suspected contamination issues. EnviroStor is available 24/7, 365 days a year. The data reflects the latest updates as they are entered in the system. Access it from your computer or smartphone, the local library – anywhere Internet access is available. Just go to www.envirostor.dtsc.ca.gov. You'll find a step-by-step tour of EnviroStor under the "How to Use EnviroStor" menu on the website.

If you have any questions or would like further information regarding your request, please contact me at 916-255-4159 or via email at PubReqAct@dtsc.ca.gov.

Sincerely,
Choua Her
Choua Her
Regional Records Coordinator

HILLMANN
CONSULTING

July 28, 2021

State of California
Department of Toxic Substances Control
Region 4 – Cypress Regional Office
5796 Corporate Avenue
Cypress, CA 90630-4732
Phone (714) 484-5337
Fax (714) 484-5318
PubReqAct@dtsc.ca.gov

RE: DTSC Files:

NW corner of Wickerd Road and Ascot Way
APNs: 360300002, -03, -04, -05, -06, -09, 360350001
Menifee, CA 92584

Dear Sir/Madam:

Hillmann Consulting, LLC is conducting an environmental investigation of the above referenced property. Under the Freedom of Information Act, we are requesting any information your office has regarding this property. If any records are located, we would like to obtain copies or schedule a file review. If no records are available, please contact me to confirm. Thank you.

Sincerely,

Alyssa Berry
Environmental Intern
Hillmann Consulting, LLC
aberry@hillmanngroup.com

Shilpa Sunil

From: City of Menifee Public Records <menifeeca@public-records-requests.com>
Sent: Monday, August 2, 2021 10:03 AM
To: Shilpa Sunil
Subject: [Document Released] City of Menifee public records request #21-367

-- Attach a non-image file and/or reply ABOVE THIS LINE with a message, and it will be sent to staff on this request. --

City of Menifee Public Records

Documents have been released for record request #21-367:

- 13-0568.pdf
- 15-0886.pdf
- 17-1877.pdf
- 19-0243.pdf
- 19-1828.pdf
- 19-0245.pdf
- 11-0261.pdf
- 10-0739.pdf
- 17-1879.pdf
- 18-0210.pdf
- 19-0162.pdf
- 19-1832.pdf
- 19-2451.pdf
- 20-0068.pdf
- 20-0069.pdf

View Request 21-367

https://cityofmenifeeca.nextrequest.com/requests/21-367

Document links are valid for one month. After September 2, you will need to sign in to view the document(s).

POWERED BY NEXTREQUEST

The All in One Records Requests Platform

Questions about your request? Reply to this email or sign in to contact staff at City of Menifee.

Technical support: See our help page

Code Enforcement Case: CE-20-0069

Entered on: 01/14/2020 10:48 AM
Printed on: 07/27/2021

Topic: Graffiti
Status: Closed
Due Date: 08/09/21
Assigned To: Officer Wiggins
Initiated by: Citizen
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name:
Address: 27125 GARBANI RD , 92584
Phone:
Cell #:
APN : 360-350-001

Owner Information

Owner Name: GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY
Address: 3161 MICHELSON #425
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Brittney Chavira	01/13/2020	3:41 pm	0.08	Request 10207-Taylor Lowell - While hiking i noticed a large outcropping of rocks, the largest of which, is covered in graffiti. I have marked its precise location on the map. You cant miss it. You can even see the graffiti from the google maps satellite images. Thats how big it is.
Inspection	Officer Wiggins	01/27/2020	3:23 pm	0.25	Drove out to the location and was able to observe that the graffiti could not be observed from the street. This location is a large hill top that is not favorable for driving up in my vehicle. Therefore if I can not observe the violation I am unable to address it.
Notice of Fees Due	Antonio Chavez	07/26/2021	11:15 am	0.00	Send to (Owner)

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date

Additional Addresses

Address Type:Complainant
Name:Taylor Lowell
Address:31846 Taton Ct
Menifee, CA 92584
Phone:(760) 505-0215 Cell #:

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Code Enforcement Case: CE-20-0068

Entered on: 01/14/2020 09:38 AM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed
Due Date: 08/09/21
Assigned To: Officer Montes
Initiated by: Citizen
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name:
Address: 27125 GARBANI RD , 92584
Phone:
Cell #:
APN : 360-350-001

Owner Information

Owner Name: GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY
Address: 3161 MICHELSON #425
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Brittney Chavira	01/13/2020	3:48 pm	0.08	Request 10208-Taylor Lowell - Many people have been dumping more and more trash here. It started out as a unusual occurence, now i see more and more every time I go by it. There is more areas than i have marked with the map. As you drive through the area you will see lots of mattresses, couches, car parts, clothing, furniture, home renovation waste, etc. Please help keep this area of out city nice. Thank you so much
Complaint	Brittney Chavira	01/16/2020	8:41 am	0.08	My City 216219- Ken Stiles- 909-721-4865 trash dumped
Closing	Officer Montes	01/22/2020	2:49 pm	0.00	Duplicate case.
Notice of Fees Due	Antonio Chavez	07/26/2021	11:14 am	0.00	Send to (Owner)

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date

Additional Addresses

Address Type:Complainant
Name:Taylor Lowell
Address:31846 Taton Ct
Menifee, CA 92584
Phone:(760) 505-0215 Cell #:

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Photographs

IMG_5632.JPG

IMG_5634.JPG

IMG_5633.JPG

Code Enforcement Case: CE-19-2451

Entered on: 07/22/2019 2:07 PM
Printed on: 07/27/2021

Topic: Weed Abatement 2019
Due Date: 08/09/21
Initiated by: Citizen

Status: Closed - Abated
Assigned To: Officer Kearney

Permit

Permit #: Business name: License #:

Property Location

Occupant Name:
Address: 27125 GARBANI RD , 92584
Phone: Cell #:
APN : 360-350-001

Owner Information

Owner Name: GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY
Address: 3161 MICHELSON #425
IRVINE, CA 92612
Phone: Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Michael Kucsan	07/22/2019	2:07 pm	0.00	Request -Lisa Spetz - The lot across the street from 27145 Wickerd Rd has overgrown weeds, brush, etc. is a fire hazard.
Case Notes	Michael Kucsan	07/25/2019	8:20 am	0.00	Note: The address listed as 27145 Wickerd Rd belongs to the complainant who is referring to a vacant lot across the street from there where the violation is occurring.
Inspection	Amber Kearney	08/09/2019	10:08 am	0.50	I arrived on location and changed the property location to the APN the RP is referring to. I observed that the vacant lot has been weed abated. CASE CLOSED.
Notice of Fees Due	Antonio Chavez	07/26/2021	11:14 am	0.00	Send to (Owner)

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date

Additional Addresses

Address Type:Complainant
Name:Lisa Spetz
Address:27145 Wickerd Rd.
Menifee, CA 92584
Phone:(951) 314-2725 Cell #:

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Photographs

file-1.jpeg

file1-1.jpeg

file2-1.jpeg

Code Enforcement Case: CE-19-1832

Entered on: 06/24/2019 2:09 PM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed
Due Date: 08/09/21
Assigned To: Officer Wiggins
Initiated by: Citizen
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name:
Address: 27125 GARBANI RD , 92584
Phone:
Cell #:
APN : 360-350-001

Owner Information

Owner Name: GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY
Address: C/O LEGAL DEPT
3161 MICHELSON #425
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Todd Solomon	06/18/2019	5:19 pm	0.00	TRASH AND DEBRIS DUMPED ON LOT
Inspection	Todd Solomon	06/24/2019	1:00 pm	0.50	FOUND TRASH AND DEBRIS ALONG WITH 5 GALLON BUCKET WITH UNKNOWN MATERIAL INSIDE
Case Notes	Todd Solomon	06/24/2019	1:20 pm	0.00	NO CHANGE TO P/O OR MAILING PER RQ.
Notice of Violation	Todd Solomon	06/24/2019	2:10 pm	0.00	Send to (Owner), Service By(Mailed)
Cert Mail Send	Vanessa Franco	06/24/2019	3:27 pm	0.08	NOTICE OF VIOLATION-GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY- CERT # 7018-0680-0002-1658-7362
Cert Mail Send	Vanessa Franco	06/24/2019	3:29 pm	0.08	NOTICE OF VIOLATION-GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY- CERT # 7018-0680-0002-1685-7379
Cert Mail Delivered	Cristina Hernandez	07/01/2019	5:28 pm	0.05	NOTICE OF VIOLATION-GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY- CERT # 7018-0680-0002-1658-7362 SIGN ILLEGIBLE
Case Notes	Brittney Chavira	01/22/2020	2:41 pm	0.08	Reassigning to new area officer per L.Martinez
Follow-Up Inspection	Officer Montes	01/22/2020	3:01 pm	0.25	I arrived at the property in response to illegal dumping complaints. I observed two large dump piles of household items. Several of the boxes containing the same name and address of "Dena Ruple - 30566 Sierra Vista Dr". I took photos for evidence and will be sending a new NOV to the property owner(s).
Notice of Violation	Officer Montes	01/22/2020	3:09 pm	0.00	Send to (Owner), Service By(Mailed)
Cert Mail Send	Cristina Hernandez	01/23/2020	10:18 am	0.08	NOTICE OF VIOLATION GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY CERT# 7019-1120-0000-3284-0817
Cert Mail Return	Brittany Hughes	01/30/2020	11:29 am	0.08	NOTICE OF VIOLATION GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY CERT# 7019-1120-0000-3284-0817- SIGNED PAM A.
Inspection	Officer Wiggins	02/19/2020	9:41 am	0.50	Drove out to the property and was able to observe that all junk, trash and debris has been removed from the property. Took photos for documentation purposes.
Notice of Fees Due	Antonio Chavez	07/26/2021	11:13 am	0.00	Send to (Owner)

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Public Nuisance - Junk, Trash, Debris and Waste - MMC § 11.20.020(A)16	1		Closed	02/19/2020

Corrections Required:It hereby is declared to be a PUBLIC NUISANCE for any person owning, leasing, occupying or having charge or

possession of any premises in the city to maintain the premises in a manner that any of the following conditions exist in, on or around the premises: (16) Items of junk, trash, debris, waste, or other personal property that are kept, placed, or stored inside of a structure or on exterior portions of real property that constitute a fire or safety hazard or a violation of any provision of the Menifee Municipal Code; or items of junk, trash, debris, waste, or other personal property that are visible from public or private real property, or that are otherwise out of conformity with neighboring community standards to such an extent as to result in, or tend to result in, a diminution in property values. Notwithstanding the foregoing, the existence of a junkyard is not a nuisance when such use and the premises on which such use occurs are in full compliance with all provisions of the Zoning Code (including all approvals and permits required thereby), and all other applicable provisions of the Menifee Municipal Code and any future amendments and additions thereto, as well as applicable county, state, and/or federal laws and regulations. - Remove all miscellaneous junk, trash, and debris from the property and/or structure(s). Failure to do so may result in the city obtaining a warrant, issuing an administrative citation and/or other administrative action. ****INCLUDING HOUSEHOLD ITEMS, FURNITURE, TIRES, AND OTHER DEBRIS****

Inspection Notes

Date: _____ Time: _____

Findings:_____

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Photographs

APN 360-350-001 06/24/2019 T. SOLOMON

DSCF0047.JPG

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

APN 360-350-001 06/24/2019 T. SOLOMON

Proof of Service_NOV CE-19-1832.pdf

APN 360-350-001 01/22/2020 A.MONTES

APN 360-350-001 01/22/2020 A.MONTES

APN 360-350-001 01/22/2020 A.MONTES

APN 360-350-001 01/22/2020 A.MONTES

APN 360-350-001 01/22/2020 A.MONTES

APN 360-350-001 01/22/2020 A.MONTES

APN 360-350-001 01/22/2020 A.MONTES

APN 360-350-001 01/22/2020 A.MONTES

PROOF OF SERVICE CE19-1832.pdf

DSCF5338.JPG

DSCF5339.JPG

Code Enforcement Case: CE-19-1828

Entered on: 06/24/2019 1:10 PM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed
Due Date: 02/06/20
Assigned To: Officer Montes
Initiated by: Citizen
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name:
Address: 0 DANIELS RD. , 92584
Phone:
Cell #:
APN : 360-300-003

Owner Information

Owner Name: RICHLAND MEADOWLAND/HILL COUNTRY S A
Address: 3161 MICHELSON DR #425
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Todd Solomon	06/18/2019	5:19 pm	0.00	TRASH AND DEBRIS ON DANIELS RD EAST OF GARBANI RD INCLUDING PIPE, AN OLD COUCH, FIVE GALLON PAINT BUCKETS, AND AN OLD TV.
Inspection	Todd Solomon	06/24/2019	12:30 pm	0.50	INSPECTION OF SECOND PARCEL EAST OF GARBANI RD FOUND SEVERAL OLD PIECES OF FURNITURE, A TV, WOOD DEBRIS, AND OTHER TRASH.
Case Notes	Todd Solomon	06/24/2019	1:10 pm	0.00	NO CHANGE TO P/O OR MAILING PER RQ.
Notice of Violation	Todd Solomon	06/24/2019	1:15 pm	0.00	Send to (Owner), Service By(Mailed)
Cert Mail Send	Vanessa Franco	06/24/2019	3:26 pm	0.08	NOTICE OF VIALATION-RICHLAND MEADOWLAND/HILL COUNTRY S A- CERT# 7018-0680-0002-1658-7355
Cert Mail Delivered	Cristina Hernandez	07/01/2019	8:07 am	0.08	NOTICE OF VIALATION-RICHLAND MEADOWLAND/HILL COUNTRY S A- CERT# 7018-0680-0002-1658-7355 sign- illegible
Follow-Up Inspection	Amber Kearney	08/22/2019	2:16 pm	1.00	Conducted 2nd inspection per Building Official. Trash and debris still remain. Issuing admin cite.
Administrative Citation	Amber Kearney	08/22/2019	2:17 pm	0.00	Administrative Citation AC-19-007811 Send to RICHLAND MEADOWLAND/HILL COUNTRY S A, Service By(Mailed)
Cert Mail Send	Michael Kucsan	08/22/2019	2:22 pm	0.08	Administrative Citation AC-19-007811 Send to RICHLAND MEADOWLAND/HILL COUNTRY S A - CERT#7018-1830-0000-6593-5062
Cert Mail Delivered	Michael Kucsan	08/30/2019	3:14 pm	0.08	Administrative Citation AC-19-007811 Send to RICHLAND MEADOWLAND/HILL COUNTRY S A - CERT#7018-1830-0000-6593-5062 - SIGNED BY PAM ALONJI
Phone Call	Amber Kearney	09/12/2019	10:43 am	0.08	Received phone call from Mike 951-453-6032 in regards to citation states he will be out today to clean up the TJD.
Phone Call	Amber Kearney	10/05/2019	8:33 am	0.08	Returned phone call and left message for Jessica Tully in regards to citation they received.
Phone Call	Andrea Montes	10/07/2019	8:27 am	0.08	Mike Medland 951-453-6032 called inquiring about the citation he received. He stated he should not have to pay the citation when he already cleaned up the property. I explained to Mr. Medland the appeal process and that his timeframe to appeal has expired.
Complaint	Officer Montes	12/16/2019	9:29 am	0.25	Received an additional complaint for illegal dumping in this area.
Inspection	Officer Montes	01/22/2020	10:34 am	0.50	I drove through the area and found two large piles of trash, furniture, and debris dumped on several different parcels.
Notice of Violation	Officer Montes	01/23/2020	1:36 pm	0.00	Send to (Owner), Service By(Mailed)

Closing	Officer Montes	04/20/2020 10:31 am	0.00	Debris was removed and dirt was placed as a barricade to prevent further illegal dumping.

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Public Nuisance - Junk, Trash, Debris and Waste - MMC § 11.20.020(A)16 Corrections Required:It hereby is declared to be a PUBLIC NUISANCE for any person owning, leasing, occupying or having charge or possession of any premises in the city to maintain the premises in a manner that any of the following conditions exist in, on or around the premises: (16) Items of junk, trash, debris, waste, or other personal property that are kept, placed, or stored inside of a structure or on exterior portions of real property that constitute a fire or safety hazard or a violation of any provision of the Menifee Municipal Code; or items of junk, trash, debris, waste, or other personal property that are visible from public or private real property, or that are otherwise out of conformity with neighboring community standards to such an extent as to result in, or tend to result in, a diminution in property values. Notwithstanding the foregoing, the existence of a junkyard is not a nuisance when such use and the premises on which such use occurs are in full compliance with all provisions of the Zoning Code (including all approvals and permits required thereby), and all other applicable provisions of the Menifee Municipal Code and any future amendments and additions thereto, as well as applicable county, state, and/or federal laws and regulations. - Remove all miscellaneous junk, trash, and debris from the property and/or structure(s). Failure to do so may result in the city obtaining a warrant, issuing an administrative citation and/or other administrative action. ***INCLUDING FURNITURE, APPLIANCES, PAINT CANS, AND OTHER TRASH AND DEBRIS***	1		Open	

Additional Addresses

Address Type:Complainant
Name:Kenneth E. Stiles
Address:
,
Phone:909-721-4865 Cell #:

Fees

Fee Type	Date	Charges	Payments	Details
Administrative Citation - First	08/22/2019	100.00		Administrative Citation AC-19-007811
		100.00	**0.00**	

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

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Photographs

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 06/24/2019 T. SOLOMON

APN 360-300-003 01/22/2020 A.MONTES

APN 360-300-003 01/22/2020 A.MONTES

APN 360-300-003 01/22/2020 A.MONTES

APN 360-300-003 01/22/2020 A.MONTES

Code Enforcement Case: CE-19-0245

Entered on: 03/01/2019 10:55 AM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed - Abated
Due Date: 04/19/19
Assigned To: Officer Burks
Initiated by: Officer
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name: VACANT LOT
Address: 0 WICKERD - DANIEL , 92584
Phone:
Cell #:
APN : 360-300-006

Owner Information

Owner Name: RICHLAND MEADOWLAND/HILL COUNTRY S A
Address: 3161 MICHELSON DR #425
C/O LEGAL DEPARTMENT
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Proactive	Donna Burks	02/23/2019	1:00 pm	0.50	ILLEGAL DUMPING ON VACANT LOT
Inspection	Donna Burks	02/23/2019	1:30 pm	0.25	MAILING OUT NOV TO PO FOR CLEAN UP OF ILLEGAL DUMPING
Notice of Violation	Donna Burks	03/01/2019	10:57 am	0.08	Send to (Owner), Service By(Mailed)
Cert Mail Send	Andrea Montes	03/04/2019	4:33 pm	0.08	Notice of Violation - RICHLAND MEADOWLAND/HILL COUNTRY S A - Cert# 7018-1830-0001-0400-5411
Follow-Up Inspection	Donna Burks	04/05/2019	3:14 pm	0.50	Reinspection- Illegal dumping has not been fully cleaned up - mailing Admin Cite
Administrative Citation	Donna Burks	04/05/2019	3:14 pm	0.00	Administrative Citation AC-19-006708 Send to RICHLAND MEADOWLAND/HILL COUNTRY S A, Service By(Mailed)
Cert Mail Send	Jacqueline Ziola	04/08/2019	4:49 pm	0.08	Administrative Citation AC-19-006708 - RICHLAND MEADOWLAND/HILL COUNTRY S A - Cert# 7017-1450-0002-1720-1587
Cert Mail Delivered	Jacqueline Ziola	04/23/2019	4:16 pm	0.08	Administrative Citation AC-19-006708 - RICHLAND MEADOWLAND/HILL COUNTRY S A - Cert# 7017-1450-0002-1720-1587 - SIGNED ILLEGIBLE
Closing	Donna Burks	06/11/2019		0.25	CLOSING CASE AS COMPLIANT
Follow-Up Inspection	Donna Burks	06/11/2019	12:00 pm	0.25	REINSPECTION- TRASH AND DEBRIS HAS BEEN CLEANED UP- NOTIFIED CONTRACTOR

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Illegal Dumping - Prohibition of Dumping - MMC § 6.10.010 Corrections Required:No person or any entity shall place, deposit, throw, leave, dispose of or dump any trash, garbage, waste, debris, refuse or matter including, but not limited to, rocks, dirt, demolition or construction waste materials, on any public or private property, whether or not the property is owned or controlled by the entity placing it there, unless: (A) The property is an approved site for the placement; or (B) There is consent of the property owner and the materials temporarily are placed on the property in appropriate receptacles for later collection and removal.	1		Closed	06/12/2019

Fees

Fee Type	Date	Charges	Payments	Details
Administrative Citation - First	04/08/2019	100.00		Administrative Citation AC-19-006708
		100.00	**0.00**	

Inspection Notes

Date: _____ Time: _____

Findings:_____

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Photographs	
DSCF7196.JPG	DSCF7197.JPG
DSCF7198.JPG	DSCF7199.JPG

DSCF7201.JPG

ILLEGAL DUMPING- WICKERD- DANIEL (6).JPG

ILLEGAL DUMPING- WICKERD- DANIEL (7).JPG

ILLEGAL DUMPING- WICKERD- DANIEL (8).JPG

ILLEGAL DUMPING- WICKERD- DANIEL (9).JPG

ILLEGAL DUMPING- WICKERD- DANIEL (10).JPG

ILLEGAL DUMPING- WICKERD- DANIEL (11).JPG

DSCF7438.JPG

DSCF7439.JPG

DSCF7441.JPG

WICKERED DUMPING (2).JPG

dumping- off of back side of garbani (1).JPG

dumping- off of back side of garbani (3).JPG

Code Enforcement Case: CE-19-0243

Entered on: 03/01/2019 10:47 AM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed - Abated
Due Date: 03/27/19
Assigned To: Officer Burks
Initiated by: Officer
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name: VACANT LOT
Address: 0 DANIEL- WICKERD , 92584
Phone:
Cell #:
APN : 360-300-003

Owner Information

Owner Name: RICHLAND MEADOWLAND/HILL COUNTRY S A
Address: 3161 MICHELSON DR #425
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Proactive	Donna Burks	02/23/2019	12:00 pm	0.50	ILLEGAL DUMPING LOCATED ON VACANT LOT-
Inspection	Donna Burks	03/23/2019	12:30 pm	0.25	MAILING NOV TO PROPERTY OWNER
Follow-Up Inspection	Donna Burks	06/11/2019	12:00 pm	0.25	REINSPECTION- CONTRACTOR HAS CLEANED UP AREA- NOTIFIED CONTRACTOR

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Illegal Dumping - Prohibition of Dumping - MMC § 6.10.010 Corrections Required:No person or any entity shall place, deposit, throw, leave, dispose of or dump any trash, garbage, waste, debris, refuse or matter including, but not limited to, rocks, dirt, demolition or construction waste materials, on any public or private property, whether or not the property is owned or controlled by the entity placing it there, unless: (A) The property is an approved site for the placement; or (B) There is consent of the property owner and the materials temporarily are placed on the property in appropriate receptacles for later collection and removal.	1		Closed	06/12/2019

Inspection Notes

Date: _____ Time: _____

Findings: _____

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Photographs

DSCF7179.JPG

DSCF7180.JPG

DSCF7181.JPG

DSCF7182.JPG

DSCF7183.JPG

DSCF7184.JPG

DSCF7186.JPG

DSCF7187.JPG

dumping- off of back side of garbani (1).JPG

Code Enforcement Case: CE-19-0162

Entered on: 02/07/2019 2:10 PM
Printed on: 07/27/2021

Topic: Illegal Camping/Trespassing
Status: Closed - Abated
Due Date: 08/09/21
Assigned To: Officer Burks
Initiated by: Officer
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name: VACANT LOT
Address: 27125 GARBANI RD , 92584
Phone:
Cell #:
APN : 360-350-001

Owner Information

Owner Name: GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY
Address: 3161 MICHELSON #425
C/O LEGAL DEPARTMENT
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Proactive	Andrea Montes	02/07/2019	2:10 pm	0.25	NEW CASE FOR ILLEGAL CAMPSITE. REFER TO CASE CE-19-0099 for notes
Notice of Violation	Andrea Montes	02/07/2019	2:14 pm	0.25	Send to (Owner,Property Location), Service By(Mailed)
Cert Mail Send	Andrea Montes	02/08/2019	4:15 pm	0.08	Notice of Violation - GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - Cert# 7018-1830-0001-0400-5688
Cert Mail Send	Andrea Montes	02/08/2019	4:16 pm	0.08	Notice of Violation - VACANT LOT -Cert# 7018-1830-0001-0400-5695
Case Notes	Andrea Montes	02/15/2019	9:32 am	0.08	First Class Mail - Notice of Violation - VACANT LOT - RTS VACANT / UNABLE TO FORWARD 2/12/2019
Cert Mail Delivered	Andrea Montes	02/15/2019	9:44 am	0.08	Notice of Violation - GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - Cert# 7018-1830-0001-0400-5688 - SIGNED ILLEGIBLE
Cert Mail Return	Andrea Montes	02/22/2019	9:12 am	0.08	Notice of Violation - VACANT LOT -Cert# 7018-1830-0001-0400-5695 - RTS VACNT / UNABLE TO FORWARD 2/14/2019
Follow-Up Inspection	Donna Burks	02/22/2019	5:09 pm	0.25	Re Inspection- the vehicles are still up on the top of the hill- the encampment needs to be cleared by property owners. Issuing citations.
Administrative Citation	Donna Burks	02/22/2019	5:09 pm	0.25	Administrative Citation AC-19-006659 Send to GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY, Service By(Mailed)
Notice of Pendency	Donna Burks	02/22/2019	5:11 pm	0.08	Send to (Owner), Service By(Mailed)
Case Notes	Donna Burks	02/22/2019	6:20 pm	0.25	COMPLAINT WENT TO THE MAYOR- I RESPONDED TO ANDREA THAT THE CAMP SITE HAS A CASE OPEN.
Case Notes	Donna Burks	02/23/2019	10:57 am	0.25	FORWARD THE COMPLAINT TO THE RSO SGT. FOR ANY ASSISTANCE WITH ENCAMPMENT
Cert Mail Send	Andrea Montes	02/25/2019	8:58 am	0.08	Administrative Citation AC-19-006659 - GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - Cert# 7018-1830-0001-0400-6739
Case Notes	Donna Burks	02/27/2019	7:58 am	0.25	Sgt. Burke with RSO- stated he will have Sgt. Avila have the Quail Valley guys assist with this encampment.
Phone Call	Donna Burks	02/27/2019	6:01 pm	0.25	RECIEVED CALL FROM DEPUTY BUELNA - HE IS GOING TO ID THE CAMPERS AND MAKE ARRESTS AND TOW VEHICLES IF POSSIBLE. I WILL TRY TO GET IN TOUCH WITH PROPERTY OWNERS.
Follow-Up Inspection	Donna Burks	03/01/2019	10:25 am	0.25	Re-Inspection- appears that the cars, and possibly the detached trailer and camp site have been removed. I am trying to reach property owners. I am mailing out a new NOV for additional violations, and I updated address with a C/O legal department
Case Notes	Donna Burks	03/01/2019	10:29 am	0.25	** MAILING NEW NOV** UPDATED MAILING ADDRESS WITH C/O LEGAL DEPARTMENT. ADDITIONAL VIOLATION ADDED.

Notice of Violation	Donna Burks	03/01/2019 10:31 am	0.08	Send to (Owner), Service By(Mailed)
Cert Mail Send	Andrea Montes	03/04/2019 4:37 pm	0.08	Notice of Violation - GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - Cert# 7018-1830-0001-0400-5374
Closing Inspection	Donna Burks	03/05/2019 3:07 pm	0.50	REINSPECTION- IT APPEARS THE ILLEGAL CAMP SITE VACATED- VIA RSO . CLOSING THIS CASE FILE.
Cert Mail Send	Andrea Montes	03/06/2019 2:16 pm	0.08	Notice of Pendency - GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - Cert# 7018-1830-0001-0400-5534
NOP Recordation	Andrea Montes	03/08/2019 9:34 am	1.00	DOC # 2019-0079655
Notice of Fees Due	Antonio Chavez	07/26/2021 11:11 am	0.00	Send to (Owner)

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Public Nuisance - Unauthorized Occupancy of RV - MMC § 11.20.020(A)32 Corrections Required:It hereby is declared to be a PUBLIC NUISANCE for any person owning, leasing, occupying or having charge or possession of any premises in the city to maintain the premises in a manner that any of the following conditions exist in, on or around the premises: (32) To occupy any vehicle, recreational vehicle, motor home, trailer or camper which is not stored or parked in a legal campground or mobile home park and connected to proper sewage disposal facilities. VACATE RECREATIONAL VEHICLE IMMEDIATELY NOT AN APPROVED CAMP SITE >> PLEASE REMOVE OCCUPIED RV FROM THE VACANT PARCEL. >> ON HILLTOP OVERLOOKING GARBANI	1		Closed	03/05/2019
2	Zoning Violation - Illegal Land Use - RR 1/2 - MMC § 9.125.030 Corrections Required:Discontinue use. Menifee City Planning Department approval and completed conditions are necessary prior to conducting this use. Contact the Planning Department at 951-672-6777 for further information.	1		Closed	03/05/2019
3	Public Nuisance - Junk, Trash, Debris and Waste - MMC § 11.20.020(A)16 Corrections Required:It hereby is declared to be a PUBLIC NUISANCE for any person owning, leasing, occupying or having charge or possession of any premises in the city to maintain the premises in a manner that any of the following conditions exist in, on or around the premises: (16) Items of junk, trash, debris, waste, or other personal property that are kept, placed, or stored inside of a structure or on exterior portions of real property that constitute a fire or safety hazard or a violation of any provision of the Menifee Municipal Code; or items of junk, trash, debris, waste, or other personal property that are visible from public or private real property, or that are otherwise out of conformity with neighboring community standards to such an extent as to result in, or tend to result in, a diminution in property values. Notwithstanding the foregoing, the existence of a junkyard is not a nuisance when such use and the premises on which such use occurs are in full compliance with all provisions of the Zoning Code (including all approvals and permits required thereby), and all other applicable provisions of the Menifee Municipal Code and any future amendments and additions thereto, as well as applicable county, state, and/or federal laws and regulations. - Remove all miscellaneous junk, trash, and debris from the property and/or structure(s). Failure to do so may result in the city obtaining a warrant, issuing an administrative citation and/or other administrative action.	1		Closed	03/05/2019
4	Illegal Dumping - Prohibition of Dumping - MMC § 6.10.010 Corrections Required:No person or any entity shall place, deposit, throw, leave, dispose of or dump any trash, garbage, waste, debris, refuse or matter including, but not limited to, rocks, dirt, demolition or construction waste materials, on any public or private property, whether or not the property is owned or controlled by the entity placing it there, unless: (A) The property is an approved site for the placement; or (B) There is consent of the property owner and the materials temporarily are placed on the property in appropriate receptacles for later collection and removal. >> PLEASE REMOVE ALL THE ILLEGAL DUMPING ON THIS SAID PARCEL. ADJACENT WITH DIRT ROAD "DANIEL AND WICKERD"	1		Closed	03/05/2019

Fees

Fee Type	Date	Charges	Payments	Details
Administrative Citation - First	02/25/2019	300.00		Administrative Citation AC-19-006659
Late Charge Penalty	03/28/2019	75.00		AC-19-006659
Citation Payment	09/23/2019		375.00	AC-19-006659 - Unknown - Collection Agency
		375.00	**375.00**	

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Photographs

Camper pic (3).jpg

CAMPSITE (1).jpg

CAMPSITE 2 (1).jpg

CAMPSITE 3 (1).jpg

CAMPSITE 4.jpg

DSCF7172.JPG

garbani camp site.jpg

DSCF7209.JPG

DSCF7175.JPG

DSCF7178.JPG

DSCF7179.JPG

DSCF7183.JPG

DSCF7190.JPG

DSCF7194.JPG

DSCF7196.JPG

DSCF7198.JPG

DSCF7199.JPG

DSCF7204.JPG

DSCF7205.JPG

RETURNED MAIL_CE-19-0162.pdf

Code Enforcement Case: CE-18-0210

Entered on: 02/06/2018 12:22 PM
Printed on: 07/27/2021

Topic: Vehicle Abatement
Status: Closed - Voluntary
Due Date: 03/02/18
Assigned To: Officer Kearney
Initiated by: Mayor/Council
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name:
Address: 27125 GARBANI RD , 92584
Phone:
Cell #:
APN : 360-350-001

Owner Information

Owner Name: GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY
Address: 3161 MICHELSON ##425
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Wayne O'Gara	02/06/2018	12:22 pm	0.00	Silver 4 dr sedan abandoned and burned. In. Field. Dirt Garbani cross of Bradley. Contact Officer OGara for additional details
Inspection	Amber Kearney	02/07/2018	1:39 pm	1.00	Arrived at location North of dirt wickered and intersection of dirt Byers up in hills observed a Silver Ford Taurus abandoned. Officer O'Gara assisted in inspection. I called dispatch for possible stolen car can back negative. Took pictures of vehicle and registration along with insurance card. Hand wrote NOTICE TO ABATE NOTICE and placed under windshield wiper.
Case Notes	Amber Kearney	02/07/2018	3:08 pm	0.50	called DMV to get last known registered owner and sending out a 10 day NOTICE TO ABATE
Vehicle Abatement - Owner	Amber Kearney	02/07/2018	3:08 pm	0.00	Send to (Owner)
Cert Mail Send	Amber Kearney	02/08/2018	8:54 am	0.00	10 DAY NOTICE TO ABATE ABANDONED - VEHICLE - GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - ARTICKE NUMBER - 7017-1450-0002-1718-3012
Phone Call	Andrea Montes	02/09/2018	3:37 pm	0.00	KOREI KILBURN (714) 809-6523 called stating he received a "Facebook message" from Councilmember Matt Liesemeyer in regards to this vehicle being abandoned. He stated Councilmember located him on Facebook by the name on vehicle registration. Vehicle owner KOREI stated that he let his "cousin" borrow the vehicle about a month ago and had not heard back from his cousin. Informed him of the vehicles last known location and he says he would be out to assess the damage tomorrow, 02/10/2018.
Cert Mail Delivered	Amber Kearney	02/21/2018	3:58 pm	0.00	10 DAY NOTICE TO ABATE ABANDONED - VEHICLE - GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - ARTICKE NUMBER - 7017-1450-0002-1718-3012- SIGNED - 02/14/2018
Follow-Up Inspection	Amber Kearney	02/28/2018	1:24 pm	0.50	Tried to do a follow-up dirt roads was wet with mud didn't want to take the chance and get stuck in the mud will return once dirt dries. extended case a few more days.
Closing Inspection	Amber Kearney	03/09/2018	11:49 am	0.50	Vehicle has been removed. CASE CLOSED

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Abandoned Vehicle(s)- Nuisance - MMC § 12.01.010	1		Open	

Corrections Required:(A) In addition to and in accordance with the determination made and the authority granted by the state under Cal. Vehicle Code § 22660 to remove abandoned, wrecked, dismantled or inoperative vehicles or parts thereof as public nuisances, the City Council makes the following findings and declarations. (B) The accumulation and storage of abandoned, wrecked, dismantled or

inoperative vehicles or parts thereof on private or public property creates a condition tending to reduce the value of private property, to promote blight and deterioration, to invite plundering, to create fire hazards, to constitute an attractive nuisance creating a hazard to the health and safety of minors, to create a harborage for rodents and insects, to be injurious to the health, safety and general welfare. (C) Therefore, the presence of an abandoned, wrecked, dismantled or inoperative vehicle or parts thereof, on private or public property, except as expressly permitted in this chapter, constitutes a public nuisance which may be abated as such in accordance with the provisions of this chapter. - Immediately remove the vehicle and/or parts, or store inside an approved storage facility (garage, etc). Failure to do so may result in the city removing the vehicle, obtaining a warrant, issuing an administrative citation and/or other administrative action. 2005 SILVER FORD TAURUS ABANDONED

Vehicle Information

Make:FORD	**Model:**TAURUS	**Year:**2005	**Color:**SILVER
License #:7FKG096	**State:**CA	**Expire:**	**VIN Number:**1FAHP53U45A311268

Additional Addresses

Address Type:Complainant Name:MATT LIESEMEYER Address:CITY OF MENIFEE COUNCILMAN MENIFEE, CA 92586 Phone:951-672-6777 Cell #:	Address Type:Owner Name:Korei Kilburn Address:639 S Webster ave Apt 219 Anaheim, CA 92804 Phone: Cell #:

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Photographs

AK 02-07-18 e.jpeg

AK 02-07-08 c.jpeg

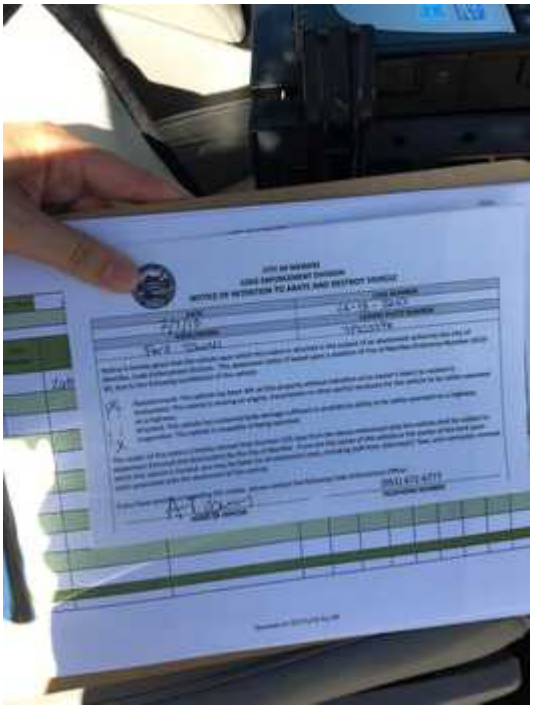
AK 02-07-18 a.jpeg

AK 02-07-18 b.jpeg

AK 02-07-18 d.jpeg

AK 02-07-18 f.jpeg

AK 02-07-18 g.jpeg



AK 02-07-18 h.jpeg

AK 02-07-18.jpeg

AK 02-07-18 i.jpeg

file-9.jpeg

Code Enforcement Case: CE-17-1879

Entered on: 08/17/2017 6:02 PM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed - Abated
Due Date: 08/09/21
Assigned To: Officer Burks
Initiated by: City Manager/Director
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name: VACANT LOT
Address: 27125 GARBANI RD , 92584
Phone:
Cell #:
APN : 360-350-001

Owner Information

Owner Name: GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY
Address: 3161 MICHELSON ##425
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Donna Burks	08/17/2017	6:06 pm	0.25	COMPLAINT RP; BURNED OUT CARS, RUBBISH, JUNK, ILLEGAL DUMPING, JET SKI, ETC. ON SAID PROPERTY.
Complaint	Donna Burks	08/17/2017	6:07 pm	0.50	1ST INSPECTION- MAILING NOV TO P/O FOR ALL ILLEGAL DUMPING, RUBBISH, AND CAR PARTS ETC.
Follow-Up Inspection	Donna Burks	08/24/2017	10:58 am	0.50	I CONDUCTED A REINSPECTION- THE JET SKI IS STILL IN MIDDLE OF FIELD, DEBRIS HAS NOT BEEN PICKED UP. MAILING FTC LETTER
Failure to Comply	Donna Burks	08/24/2017	10:59 am	0.00	Progress Made:No, Send to (Owner)
Cert Mail Send	Andrea Montes	08/29/2017	8:47 am	0.00	Failure to Comply - GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - 7017-1450-0002-1716-8446
Cert Mail Delivered	Andrea Montes	08/30/2017		0.00	Failure to Comply - GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - 7017-1450-0002-1716-8446 - SIGNED PAM ALORGI
Phone Call	Donna Burks	08/31/2017	8:06 am	0.25	I SPOKE WITH THE CONTRACTOR; MIKE @ 951-453-6032 FOR THE PROPERTY OWNER; WHO IS COMING UP WITH A BID FOR CLEAN UP OF TRASH AND DEBRIS, JET SKI, ETC.
Follow-Up Inspection	Donna Burks	09/07/2017	8:54 am	0.00	The property has not been cleaned up; Mailing out Admin Cite
Administrative Citation	Donna Burks	09/07/2017	8:55 am	0.00	Administrative Citation AC-17-004840 Send to GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY, Service By(Mailed)
Notice of Pendency	Donna Burks	09/07/2017	8:55 am	0.00	Send to (Owner), Service By(Mailed)
Follow-Up Inspection	Donna Burks	09/07/2017	8:58 am	0.50	MIKE THE CONTRACTOR FOR PO CALLED AND STATED THAT THE PARCELS WILL BE CLEANED UP; BY MONDAY 951-453-6032
Cert Mail Send	Andrea Montes	09/08/2017	10:04 am	0.08	Administrative Citation AC-17-004840 Send to GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - 7017-1450-0002-1716-9870
Cert Mail Delivered	Andrea Montes	09/11/2017	1:15 pm	0.08	Administrative Citation AC-17-004840 Send to GOLDEN MEADOWLAND/GOLDEN HILL COUNTRY - 7017-1450-0002-1716-9870 - SIGNED A ADAMS
Phone Call	Andrea Montes	09/19/2017	9:50 am	0.25	Spoke with Allison Adam requesting a follow-up inspection, as well as a 602 PC form to try to prevent further illegal dumping on their property. E-mailed to Allison (aadams@richlandcommunities.com) a Letter of Authority 602 PC.
Cert Mail Send	Andrea Montes	09/20/2017	8:29 am	0.00	NOP cert # 7017-1450-0002-1718-2282
Cert Mail Delivered	Andrea Montes	09/27/2017	10:34 am	0.08	NOP cert # 7017-1450-0002-1718-2282 - SIGNED PAM ALORGI
NOP Recordation	Andrea Montes	10/25/2017		0.00	DOC # 2017-0444956
Case Notes	Amber	12/19/2017	7:54 am	0.00	Community Services clean up crew went out to clean area up, found that the

	Kearney			area was already abated. Case Closed.
Notice of Fees Due	Antonio Chavez	07/26/2021 10:56 am	0.00	Send to (Owner)

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Illegal Dumping - Prohibition of Dumping - MMC § 6.10.010 Corrections Required:No person or any entity shall place, deposit, throw, leave, dispose of or dump any trash, garbage, waste, debris, refuse or matter including, but not limited to, rocks, dirt, demolition or construction waste materials, on any public or private property, whether or not the property is owned or controlled by the entity placing it there, unless: (A) The property is an approved site for the placement; or (B) There is consent of the property owner and the materials temporarily are placed on the property in appropriate receptacles for later collection and removal. >> REMOVE ALL ILLEGAL DUMPED ITEMS ON SAID PROPERTY; RUBBISH, EQUIPMENT, FURNITURE, BUCKETS, TRASH, MISCELLANEOUS ITEMS ETC. CLEAR PARCEL OF ALL ILLEGAL DUMPED ITEMS, AND KEEP PROPERTY MAINTAINED ON A REGULAR BASIS.	1		Open	
2	Administrative Provisions - Rubbish and Debris - MMC § 8.01.020 Corrections Required:Every person who constructs, alters, adds to, rehabilitates, places or repairs any building structure or building service equipment is subject to the following provision relating to rubbish and debris. (A) Collection and disposal. During the process of constructing a building or structure, the construction site and the general area around the site shall be kept clear of rubbish and debris that result from the construction activities. Rubbish and debris shall not be allowed to accumulate on or be blown from the site and shall be placed in appropriate containers or removed from the construction site to an authorized disposal area. All containers shall be emptied periodically at an authorized disposal area so they will remain usable for the collection of rubbish and debris. When the building or structure is completed, a final cleanup of the site shall be conducted by the permittee. (B) Inspections. A permit holder shall not be entitled to, and no building inspector shall make an inspection of any phase of completed construction work, including the final inspection, if the construction site or general area thereof contains an accumulation of construction rubbish and debris. If a building inspector is unable to conduct a requested inspection because of an accumulation of rubbish and debris, a re-inspection fee may be assessed and required to be paid prior to a request for re-inspection is made. Failure to maintain a construction site clear of waste and other trash or debris, and in a manner that is determined to constitute a health and safety hazard or constitutes a public nuisance, shall result in the issuance of a stop work order. (C) Inclusions. Rubbish and debris for the purpose of this section, includes, but is not limited to, stub ends of cut lumber, broken lumber and other scrap wood, scrap cement and plaster, scrap metal, paper cartons, wrappings and similar materials that result from the process of constructing a building or structure. - Remove all miscellaneous junk, trash, or debris from the site, and maintain the property free of material build-ups.	1		Open	
3	Public Nuisance - Storage of Vehicles/Parts - MMC § 11.20.010(M) Corrections Required:It hereby is declared to be a PUBLIC NUISANCE for any person owning, leasing, occupying or having charge or possession of any premises in the city to maintain the premises in a manner that any of the following conditions exist in, on or around the premises: (M) Storage outside of abandoned or unused vehicles or parts thereof or of vehicles and/or parts under repair or used therefore to the extent not otherwise preempted; - Immediately remove the vehicle and/or parts, or store inside an approved storage facility (garage, etc). >> REMOVE ALL BURNED, ABANDONED, DISCARDED VEHICLE'S AND/OR PARTS THERE OF; INCLUDING "SEADOO" OR JET SKI.	1		Open	

Additional Addresses

Address Type:Complainant
Name:J. CRAIG GRUBER
Address:26675 GARBANI
MENIFEE, CA
Phone:949-233-6771 Cell #:951-244-7657

Fees

Fee Type	Date	Charges	Payments	Details
Administrative Citation - First	09/08/2017	300.00		Administrative Citation AC-17-004840
Late Charge Penalty	10/09/2017	75.00		AC-17-004840
Citation Payment	01/16/2018		375.00	AC-17-004840 - Check Number: 2274 - Data Ticket
		375.00	**375.00**	

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Photographs

360-350-001 (1).JPG

360-350-001 (2).JPG

360-350-001 (3).JPG

360-350-001 (4).JPG

360-350-001 (5).JPG

360-350-001 (6).JPG

360-350-001 (7).JPG

Code Enforcement Case: CE-17-1877

Entered on: 08/17/2017 5:53 PM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed
Due Date: 09/15/17
Assigned To: Officer Burks
Initiated by: City Manager/Director
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name: VACANT LOT
Address: 0 DANIEL , 92584
Phone:
Cell #:
APN : 360-300-003

Owner Information

Owner Name: RICHLAND MEADOWLAND/HILL COUNTRY S A
Address: 3161 MICHELSON DR ##425
IRVINE, CA 92612
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Donna Burks	08/17/2017	5:53 pm	0.25	COMPLAINT; ILLEGAL DUMPING OF TRASH AND DEBRIS
Inspection	Donna Burks	08/17/2017	5:54 pm	0.50	1ST INSPECTION- I OBSERVED JUNK, RUBBISH, DEBRIS, ILLEGAL DUMPING THROUGH OUT; TWO BURNED OUT VEHICLES.
Notice of Violation	Donna Burks	08/17/2017	5:56 pm	0.00	Send to (Property Location), Service By(Mailed)
Refer Case	Donna Burks	08/17/2017	5:56 pm	0.00	REFERRED THE BURNED OUT VEHICLES TO AVA OFFICER WAYNE OGARA.
Follow-Up Inspection	Donna Burks	09/01/2017	5:11 pm	0.50	REINSPECTION- I CONDUCTED A REINSPECTION- THERE IS STILL TRASH, DEBRIS, ILLEGAL DUMPING ON PARCEL THROUGH OUT BRUSH, ETC. MAILING ADMIN CITE #1
Administrative Citation	Donna Burks	09/01/2017	5:11 pm	0.00	Administrative Citation AC-17-004824 Send to RICHLAND MEADOWLAND/HILL COUNTRY S A, Service By(Mailed)
Notice of Pendency	Donna Burks	09/01/2017	5:26 pm	0.00	Send to (Owner), Service By(Mailed)
Cert Mail Send	Andrea Montes	09/05/2017	4:53 pm	0.00	Administrative Citation AC-17-004824 Send to RICHLAND MEADOWLAND/HILL COUNTRY S A - 7017-1450-0002-1716-9498
Follow-Up Inspection	Donna Burks	09/07/2017	8:56 am	0.50	MIKE THE CONTRACTOR CALLED AND STATED HE WILL BE CLEANING UP THE AREA ON MONDAY; 951-543-6032
Phone Call	Amber Kearney	09/11/2017	8:32 am	0.17	Phone Call: Allison Adams project Coordinator for Richland Meadowland. (949)383-4136 in regards to citation received. States she never received NOV. Informed her that a NOV was generated on 8/17/17. Explained the appeal process and referred her to Officer Burks.
Cert Mail Delivered	Andrea Montes	09/11/2017	6:28 pm	0.08	Administrative Citation AC-17-004824 Send to RICHLAND MEADOWLAND/HILL COUNTRY S A - 7017-1450-0002-1716-9498 - SIGNED PAM ALONG
Cert Mail Send	Andrea Montes	09/15/2017	9:04 am	0.08	NOP cert # 7017-1450-0002-1718-2138
Case Notes	Andrea Montes	09/19/2017	9:48 am	0.25	Spoke with Allison Adam requesting a follow-up inspection, as well as a 602 PC form to try to prevent further illegal dumping on their property. E-mailed to Allison (aadams@richlandcommunities.com) a Letter of Authority 602 PC.
Cert Mail Delivered	Andrea Montes	09/22/2017	10:35 am	0.08	NOP cert # 7017-1450-0002-1718-2138 - signed PAM ALONG
NOP Recordation	Amber Kearney	10/20/2017	4:04 pm	0.00	DOC NOP # 2017-0413157
Case Notes	Amber Kearney	12/19/2017	7:59 am	0.00	Community services clean up crew was sent to abate any TJD. Case Closed.

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Illegal Dumping - Prohibition of Dumping - MMC § 6.10.010 Corrections Required:No person or any entity shall place, deposit, throw, leave, dispose of or dump any trash, garbage, waste, debris, refuse or matter including, but not limited to, rocks, dirt, demolition or construction waste materials, on any public or private property, whether or not the property is owned or controlled by the entity placing it there, unless: (A) The property is an approved site for the placement; or (B) There is consent of the property owner and the materials temporarily are placed on the property in appropriate receptacles for later collection and removal. >> PLEASE REMOVE ALL ILLEGAL DUMPING, TRASH AND DEBRIS SUCH AS; BUCKETS, BROKEN COMPUTERS, FURNITURE, CAR PARTS, ETC. MAINTAIN THE SAID PROPERTY ON A REGULAR BASIS FROM ILLEGAL DUMPING	1		Open	
2	Public Nuisance - Junk, Trash, Debris and Waste - MMC § 11.20.020(A)16 Corrections Required:It hereby is declared to be a PUBLIC NUISANCE for any person owning, leasing, occupying or having charge or possession of any premises in the city to maintain the premises in a manner that any of the following conditions exist in, on or around the premises: (I) Rubbish, garbage or junk of any kind (inside or outside a structure) existing or maintained for over five consecutive calendar days on private property or the property of another public agency which creates a health or safety hazard; or which otherwise is unsightly: (1) RUBBISH or GARBAGE includes, but is not limited to, general trash; waste paper; lumber or wood, cardboard or other flammable material of any kind; garbage, including, but not limited to, decayed waste or discarded food, meat, fish animal or vegetable refuse or any putrid or offensive animal or vegetable matter; or any hazardous materials or waste oil, gasoline or diesel products ; accumulated rubbish or excess outside storage of rubbish, garbage or junk; and (2) JUNK includes, but is not limited to, any secondhand and used machinery, scrap metal, appliances, rubber, tools, implements or parts or portions thereof, batteries, ropes, rags or plastic. - Remove all miscellaneous junk, trash, and debris from the property and/or structure(s). Failure to do so may result in the city obtaining a warrant, issuing an administrative citation and/or other administrative action.	1		Open	

Additional Addresses

Address Type:Complainant
Name:J. CRAIG GRUBER
Address:26675 GARBANI
MENIFEE, CA
Phone:949-233-6771 Cell #:951-244-7657

Fees

Fee Type	Date	Charges	Payments	Details
Administrative Citation - First	09/05/2017	200.00		Administrative Citation AC-17-004824
		200.00	**0.00**	

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Photographs

DANIEL RD (1).JPG

DANIEL RD (2).JPG

DANIEL RD (3).JPG

DANIEL RD (4).JPG

DANIEL RD (5).JPG

DANIEL RD (6).JPG

DANIEL RD- BURNED CARS (1).JPG

Recorded NOP CE-17-1877.pdf

CE-17-1877 After .JPG

CE-17-1877 before .JPG

Code Enforcement Case: CE-15-0886

Entered on: 07/16/2015 12:56 PM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed - Abated
Due Date: 08/09/21
Assigned To: Officer Burks
Initiated by: Officer
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name:
Address: 0 GARBANI , 0
Phone:
Cell #:
APN : 360-350-002

Owner Information

Owner Name: SIERRA MADRE LAND CO
Address: 760 SILVER CREST CT
LAFAYETTE, CA 94549
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Proactive	Donna Burks	07/16/2015	12:56 pm	0.50	1ST INSPECTION- I OBSERVED A VACANT LOT WITH ILLEGALLY DUMPED TRASH, LITTER, RUBBISH AND DEBRIS- CAR PARTS, MATTRESSES, SHOPPING CARTS ETC. MAILING NOV
Notice of Violation	Donna Burks	07/16/2015	3:18 pm	0.00	Send to (Owner), Service By(Mailed)
Citizen Contact	Donna Burks	07/22/2015	9:42 am	0.00	Brian Smith- 951-333-1526; is out cleaning up the property at this time..
Follow-Up Inspection	Donna Burks	07/22/2015	1:06 pm	0.50	Reinspection- I met clean up crew out there- mattress is not on their property - that falls on property next to them.. they cleaned up their side.
Closing Inspection	Donna Burks	07/22/2015	1:06 pm	0.00	closing case as complied
Notice of Fees Due	Antonio Chavez	07/26/2021	2:54 pm	0.00	Send to (Owner)

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
	Illegal Dumping - Prohibition of Dumping - MMC § 6.10.010	1		Closed	07/22/2015
1	Corrections Required:No person or any entity shall place, deposit, throw, leave, dispose of or dump any trash, garbage, waste, debris, refuse or matter including, but not limited to, rocks, dirt, demolition or construction waste materials, on any public or private property, whether or not the property is owned or controlled by the entity placing it there, unless: (A) The property is an approved site for the placement; or (B) There is consent of the property owner and the materials temporarily are placed on the property in appropriate receptacles for later collection and removal. PLEASE REMOVE ALL ILLEGALLY DUMPED TRAHS, LITTER, RUBBISH, METAL, PLASTICS, MATTRESSES, SHOPPING CARTS ON SAID VACANT LOT.. PART OF A CAR FENDERE AS WELL.				

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Photographs

Garbani (1).JPG

Garbani (2).JPG

Garbani (3).JPG

Code Enforcement Case: CE-13-0568

Entered on: 06/06/2013 4:03 PM
Printed on: 07/27/2021

Topic: Weed Abatement 2013
Status: Closed - Abated
Due Date: 08/09/21
Assigned To: Officer Burks
Initiated by: Officer
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name:
Address: VACANT LOT GARBANI , 92584
Phone:
Cell #:
APN : 360-350-002

Owner Information

Owner Name: SIERRA MADRE LAND CO
Address: 760 SILVER CREST CT
LAFAYETTE, CA 94549-5247
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Inspection	Donna Burks	06/06/2013	4:03 pm	0.50	1ST INSPECTION; OVERGROWN VEGETATION; UP TO THE STREET ON GARBANI
Abatement of Hazardous Vegetation	Donna Burks	06/06/2013	4:07 pm	0.00	Progress Made:No, Send to (Owner)
Administrative Citation	Donna Burks	06/06/2013	4:07 pm	0.00	Administrative Citation AC-13-000199 Send to SIERRA MADRE LAND CO, Service By(Mailed)
Inspection	Donna Burks	06/14/2013	3:56 pm	0.25	Reinspection; weed abatement has been completed. closing case
Notice of Fees Due	Antonio Chavez	07/26/2021	2:52 pm	0.00	Send to (Owner)

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
	Abatement of Hazardous Vegetation - Duty to Abate Hazardous Vegetation - Ord 695, Section 3 as adopt	1		Closed	06/14/2013
1	Corrections Required:THE REQUIREMENTS OF THE NOTICE AND ORDER TO ABATE SHALL BE SATISFIED BY DISKING, MOWING, BRUSH-CUTTING, AND/OR HANDWORD AND REMOVAL OF CUT MATERIAL OF THE DANGEROUS VEGETATION AS INDICATED BELOW: -The parcel (inclusing easements as required) shall have weeds cut and maintained as noted below AND free of junk and/or debris at all times -Keep clear a 100-foot wide strip where you are adjacent to a parcel with a structure -Keep clear a 100-foot wide strip where you are adjacent to any roadway >>DISK, MOW, CUT, TRIM ALL OVERGROWN AND/OR DRY VEGETATION ON VACANT PARCEL; TRIM TREES. >> KEEP CLEAR A 100 FOOT WIDE STRIP WHERE YOU ARE ADJACENT TO ANY ROADWAY				

Fees

Fee Type	Date	Charges	Payments	Details
Administrative Citation - First	06/11/2013	100.00		Administrative Citation AC-13-000199
Late Charge Penalty	07/12/2013	25.00		AC-13-000199
		125.00	**0.00**	

Inspection Notes

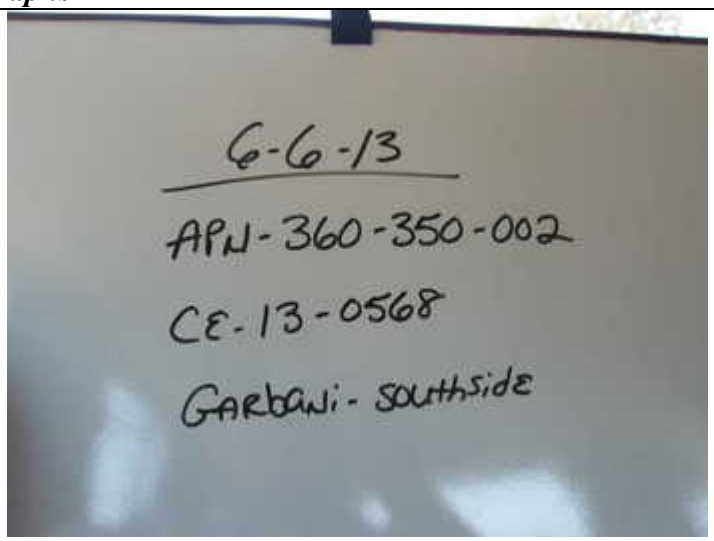
Date: _____ Time: _____

Findings:_____

_____

Photographs

13-0568 (1).JPG



13-0568 (2).JPG

13-0568 (3).JPG

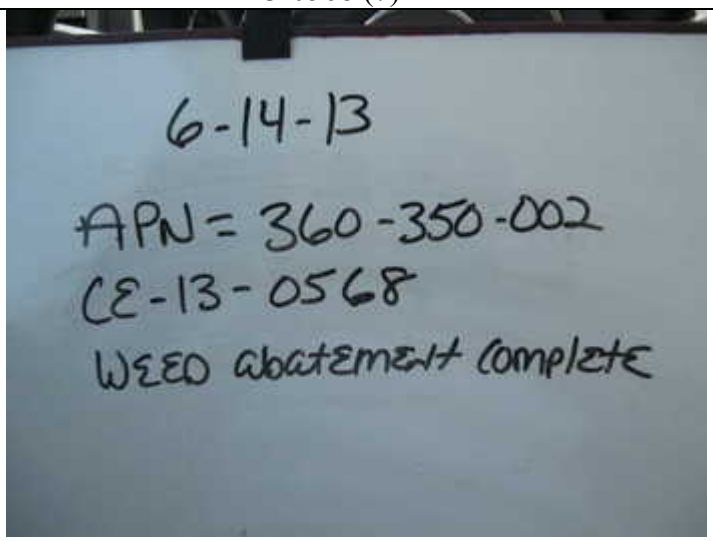
13-0568 (4).JPG

13-0568 (5).JPG

13-0568 (6).JPG

13-0568 (7).JPG

13-0568; WEED ABATEMENT COMPLETE (1).JPG



13-0568; WEED ABATEMENT COMPLETE (2).JPG

13-0568; WEED ABATEMENT COMPLETE (3).JPG

Code Enforcement Case: CE-11-0261

Entered on: 04/08/2011 11:54 AM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed
Due Date: 04/20/11
Assigned To: Scott Stoll
Initiated by:
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name:
Address: ,
Phone:
Cell #:
APN : 360-300-009

Owner Information

Owner Name: BBC MENIFEE LAND LLC
Address: 555 SKOKIE BLVD #555
NORTHBROOK, IL 60062-2854
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Carmen Cave	04/08/2011	11:54 am	0.00	Request -Lisa Spetz - on the hill at the corner of Wickerd & Bradley
Inspection	Scott Stoll	04/14/2011	10:15 am	0.00	On 04/14/2011, at approximately 0925 hours, I arrived at the subject property in response to a request for service- Illegal dumping. Upon arrival and from the road right of way, I observed the dumpsite that consisted of discarded rugs and card board boxes. I inspected the dumpsite for any evidence of the responsible party. This action resulted with negative results. I called City of Menifee Public Works and asked if they could pick up the items. Waste Management is unable to do so. I will close the case once Public works picks up the discarded items.
Case Notes	Scott Stoll	04/14/2011	11:26 am	0.00	On 04/14/2011, at approximately, I received a phone call from public works advising me they picked up the discarded items. Case Closed.

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Illegal Dumping - Non commerical, less than one cubic yard 374.3(a)	1		Closed	04/14/2011

Additional Addresses

Address Type:Complainant
Name:Lisa Spetz
Address:27145 Wickerd Rd.
Menifee, CA 92584
Phone:(951) 314-2725 Cell #:

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Photographs

04.14.2011 003.jpg

04.14.2011 001.jpg

04.14.2011 002.jpg

Code Enforcement Case: CE-10-0739

Entered on: 11/19/2010 08:52 AM
Printed on: 07/27/2021

Topic: Illegal Dumping
Status: Closed
Due Date: 01/09/11
Assigned To: Scott Stoll
Initiated by: Neighbor
Hearing Date:
Hearing Time:

Permit

Permit #:
Business name:
License #:

Property Location

Occupant Name:
Address: , 92587-7444
Phone:
Cell #:
APN : 360-350-001

Owner Information

Owner Name: Richland Meadowland LTD
Address: 4100 Newport Place
Newport Beach, CA 92660
Phone:
Cell #:

Actions

Action	By	Date	Time	Hours	Note/Observation
Complaint	Carmen Cave	11/16/2010	8:57 am	0.00	Request 438-Lisa Spetz - From Haun Road, just passed the Verizon center when the road turns to dirt, we have a coulple of desk pieces dropped off to the left. Going further up on the hill of Wickerd Rd. there is 4 mattresses a couple of TV's a chair and other debris.
Case Notes	Carmen Cave	11/19/2010	8:52 am	0.00	Location approximate. Please review request from RP
Case Notes	Carmen Cave	12/06/2010		0.00	Call from huisband, Eddie Spetz informing City that more trash has been dumped on site and he was reporting that he took some trash away from the site from Erica Laredo 951-693-4171 cell 562-382-7170. He stated that if the City does not call him back he will call the person on the mail and ghet the problem taken care of himself.
Case Notes	Carmen Cave	12/07/2010		0.00	Returned call to Eddie Spetz; left VM inidicating that the site has been tainted if they remove items from the site.
Case Notes	Carmen Cave	12/08/2010	9:32 am	0.00	Lisa and Eddie Spetz came to front counter to inquire about status of case. Were informed that case has been assigned but had not yet been addressed. They provided information about items being dumped again overnight--parcels in questions are 350-350-001 and 360-260-010
Case Notes	Scott Stoll	01/04/2011	3:35 pm	0.10	I contacted Richland Investment and spoke with with John Troutman (Chief Legal Consil) at (949) 261-7010 . Mr. Troutman desires prosecution. I will send a Dumping/Trespassing Letter via fax
Citation-Criminal	Scott Stoll	01/07/2011	9:43 am	0.10	Cite #(MC 01521), Name(Andre Martinez), DOB(10/08/1986), Drivers Lic(D5019065), Court Date(02/08/2011), Court Name(Temecula), # Counts(2), Penalty(Infraction)
Case Notes	Scott Stoll	01/10/2011	4:17 pm	0.10	Case closed with closing photos. Dump receipt and report to follow
Inspection	Scott Stoll	01/21/2011	4:07 pm	0.50	Case No.: CE-10-0739 Date Opened: 12/09/2010 District Office: 3 Address: Wickerd /Hahn Community: Menifee APN# 360-350001 ========== Violation Type: 374.3 (A) Illegal Dumping Violation Status: 1. Infraction x2 Tier: Comments: OFFICE NARRITIVE: On 12/09/2010, I received a request of service regarding illegal dumping. ASSIGNMENT:

I am currently assigned to the Illegal Dumping Task Force as an Officer with the City of Menifee, Code Enforcement Division. For identification purposes, a uniform, badge, and identification card are issued and worn.

OBSERVATION:

On 12/09/2010, at approximately 1300hours, I arrived at the dumpsite located at Wickerd Road and Hahn Road in the City of Menifee. I observed approximately two couches, two mattresses, and cardboard boxes, three black plastic trash bags. I sifted through the black plastic trash bags and retrieved mail addressed to Andre Martinez, with an address of 32761Cox Road Menifee Ca, 92584

A second piece of mail was addressed to Erika Loredo with an address of 11854 166th Street Artesia, California 90701. The black plastic bags contained house hold trash that consisted of: Cereal boxes, rotten eggs, milk, house hold cleaner, meat, and discarded trash.

SUSPECT LEAD: WINDY GARCIA

On 12/09/2010, at approximately 1340 hours, I arrived at subject property 32761Cox Road. I was greeted by a HFA who verbal identified herself as Windy Garcia (Property owner) (951) 533-3673. I identified myself as a City of Menifee Code Enforcement Officer. I explained to Mrs. Garcia that I was conducting an investigation of illegal dumping, and I was looking to speak with an Andre Martinez or Erika Loredo.

Mrs. Garcia told me they were tenants of hers and did live at the property, but recently moved out. I asked Mrs. Garcia if she could provide the names of the tenants. Mrs. Garcia told me the tenants were husband and wife. The names she provided were Andre Martinez and Erika Loredo. I asked Mrs. Garcia if she had any knowledge of their current address. Mrs. Garcia told me the couple is going through a divorce and Erika lives in Menifee, but she was unsure of the address. Andre is living at a property in Murrieta. She told me she was unsure of the address, but she told me it is the last house on the left side of Joan Dunn Lane, North of the new Loma Linda Hospital in Murrieta.

I asked Mrs. Garcia if the tenants provided a reason for moving. She told me that Andre told her, that he was involved in a crime and the Riverside County Sheriff's Department are placing him and his wife and child into protective custody.

I asked Mrs. Garcia if she had a contact number for Andre. I was provided the number of (951-219-8124.) I asked Mrs. Garcia if she could describe what type of vehicle the couple drove. She told me that Andre drives a Toyota Tundra Gray in color (Pick Up). She had the License number on her phone. She provided me with California license# 8G266455. She was unsure what vehicle Erika drove. I asked Mrs. Garcia is she was ever inside of the Martinez house while they were renting it from her. She told me she had been inside several times. I asked Mrs. Garcia is she was willing to drive to the dumpsite that is .5 miles from her home and identify the items illegally discarded. Mrs. Garcia told me she was willing to drive to the dumpsite with me.

Prior to allowing Mrs. Garcia into my city issued vehicle, I utilized my city issued cell phone and contacted my Supervisor, Director Cave as my immediate supervisor was off for the day. I requested authorization to transport to the dumpsite for identification purposes. Director Cave authorized the transport. Upon arrival of the dumpsite, Mrs. Garcia continually repeated the same sentence "Oh My Gosh." Mrs. Garcia identified the two coaches located at the dumpsite. I transported her back to her home and thanked her for her time.

SUSPECT CONTACT: ANDRE MARTINEZ:

I conducted a Telephonic interview, due to a rain storm and unsafe driving conditions. I called Mr. Martinez on his cell phone. I identified myself as a City of Menifee Code Enforcement Officer and I explained I was conducting an investigation of illegal dumping. I asked Mr. Martinez if he recently moved from 32761Cox Road. Mr. Martinez stated, "Yes."

I asked him where he took the items that were inside of the Cox address. The subject told me, that he took the items to the dump with a rented Penske truck. I asked the

subject if he had a dump receipt. He told me he didn't receive one. I asked him what landfill he disposed of his waste matter. Mr. Martinez told me The Perris Land fill off of Goetz Road. I asked him how long ago he was at the Perris Land fill. The subject told me within the last two weeks. I explained to Mr. Martinez that the landfill has cameras that capture the time a vehicle enters the landfill and exits. I explained to the subject, that based off of the time frame and the vehicle used, it would be easy to determine if he was ever at the land fill.

I asked Mr. Martinez what items he took to the dump. He told me two couches and trash. I asked him if he could remember the color of the couches. He told me the couches were green. I explained to Mr. Martinez that I have a person that identified the couches at the dumpsite. Mr. Martinez stated, "Ok, I did it, I dumped the couches." I asked him how he transported the couches. Mr. Martinez told me he rented a Penske Truck. I asked him to describe how he illegally dumped the items, and the location.

Mr. Martinez told me he was going through a divorce and most of the stuff was his wife's stuff, and he was pissed so to get rid of the trash and couches in a hurry, he used the rented Penske Truck, and dumped the items on Wicked Road. I asked him how many times he illegally dumped at the Wickerd dumpsite. Mr. Martinez told me he dumped twice.

I told Mr. Martinez that I would call him when the rainstorm passed and that I had additional questions.

On 12/08/2010, at approximately 1300 hours, I received a phone message from Andre Martinez. Mr. Martinez asked to meet with me at 28739 Dijon Street Menifee at 1430 hours.

On 12/09/2010, at approximately 1500 hours, I arrived at the 28739 Dijon Street address for the purpose of contacting Dumping Suspect Andre Martinez. Upon arrival, I was greeted by Andre Martinez. Mr. Martinez apologized for not contacting me earlier, but he had family emergency in Mexico.

I asked Mr. Martinez if he could identify himself with a California Drivers License or California Identification Card: the subject produced a California Identification Card with the number # of D5019065: which identified him as Andre Constantine Martinez, Date of Birth:10/08/1986. When I recorded the necessary information from the California Identification Card, I returned his Card.

I asked Mr. Martinez if I could video record our interview. He told me I could. I explained to the subject that the interview is not going to be that entailed, considering he answered most of my questions during our Telephonic Interview.

During the video interview, I asked Mr. Martinez, to explain what brought us together. Mr. Martinez stated, "You contacted me about a dumpsite". I asked the subject where the items at the dumpsite came from. Mr. Martinez stated, "From my old house."

I asked if he knew where the dumpsite was located. The subject stated, "I think it is on Wickerd Road. I asked him if he knew what the contents of dumpsite were. He said, "Random articles of trash. I asked him if he acted solo during the illegal dumping. Mr. Martinez said, "Yes,"

I asked how many times he dumped at the Wickerd dumpsite. Mr. Martinez told me he dumped twice. I asked the subject why he illegally dumped. He told me that he and his wife are getting divorced and he had no place to take the trash.

I asked him if he had trash service at the Cox address. The subject said, "Yes, but there weren't enough cans." I asked Mr. Martinez if he believed what he did was wrong. He stated, "Yes". I asked Mr. Martinez if anyone paid him to illegally dispose of the trash. He said, "No."

I asked Mr. Martinez if anyone or the property owner gave him permission to dump the trash. He said, "No." I asked him if all the trash came from his home. He said, "Yes." I terminated my interview. I issued Mr. Martinez a Criminal Infraction Citation # MC 01521 for P.C 374. (A) Illegal Dumping- x two. He was cited into the Temecula Court with a date of 02/08/2010.

VICTIM INFORMATION:

Richland Meadowland LTD 4100 Newport Place Drive Ste 800. Newport Beach Ca, 92660.

On 01/04/11 at 1510 hours. I Spoke with John Troutman: Chief Legal Counsel Contact: (949) 261-7010 Fax- (949) 261-7016 . Mr. Troutman Desires Prosecution.

SCENE:

The dump site is located on a vacant portion of land. The land is approximately 80 Acres. The property was open and accessible to the public. I did not observe any signs prohibiting access onto the property. The property is located at the corner of Wickerd and Haun Rd. The illegal dump consisted of approximately two black plastic trash bags that contained house hold trash, mail correspondence, two mattresses, and two couches.

I took the measurement using the pace method (1pace equals 3 feet.) The dimensions were estimated at 10'in length and 9' feet in width. Visual estimate, a height of 2'.

The cubic yard measurement is calculated from the length, ten feet, multiplied by the width, nine feet, multiplied by the height, two feet, divided by 27. Using this formula I calculated that approximately 6.6 cubic yards of debris were illegally dumped on the subject property. The dump has been cleaned up by Mr. Martinez. I have a closing photograph of the subject property clean and clear of trash.

EVIDENCE

Item # 1 Forty (40) digital photographs of the dump site as discovered on 12/09/2010
Item # 2 Mail discovered on 12/09/2010 at the dump location.
Item # 3 Geographic Information System (GIS) report for dump site – APN 360-350001
Item # 4 Taped confession with sound and video of Andre Martinez. (Available upon request.)

WITNESS:

None

DISPOSITION:

Based on my observation, and the totality of evidence, I request charges of penal code 374.3 (A) be filed against Mr. Martinez by the District Attorney's Office.

Pursuant to P.C. 1202.51, I request that suspect Andre Martinez have included in the judgment against him the additional penalty as prescribed in PC 1202.51.

PC 1202.51. In any case in which a defendant is convicted of any of the offenses enumerated in Section 372, 373a, 374.3, 374.4, 374.7, or 374.8, the court shall order the defendant to pay a fine of one hundred dollars ($100) if the conviction is for an infraction or two hundred dollars ($200) if the conviction is for a misdemeanor, in addition to any other penalty or fine imposed. If the court determines that the defendant has the ability to pay all or part of the fine, the court shall set the amount to be paid and order the defendant to pay that sum to the city or, if not within a city, the county, where the violation occurred, to be used for the city's or county's illegal dumping enforcement program. Notwithstanding any other provision of law, no state or county penalty, assessment, fee, or surcharge shall be imposed on the fine ordered under this section

Case Notes	Scott Stoll	01/24/2011 4:00 pm	0.00	I uploaded a scanned copy of the illegal dumping report

Violations

#	Violation Type	Grouping	Due Date	Status	Closed Date
1	Illegal Dumping - Non commerical, less than one cubic yard 374.3(a)	1		Open	

Corrections Required:x2

Additional Addresses

Address Type:Complainant
Name:Lisa Spetz
Address:27145 Wickerd Rd.
Menifee, CA 92584
Phone:(951) 314-2725 Cell #:

Inspection Notes

Date: _____ Time: _____

Findings:_____

_____

_____

_____

Photographs

Subject property illegally disposed items came from

Dumpsite

12.09.10 002.jpg

12.09.10 003.jpg

12.09.10 004.jpg

12.09.10 005.jpg

12.09.10 006.jpg

12.09.10 007.jpg

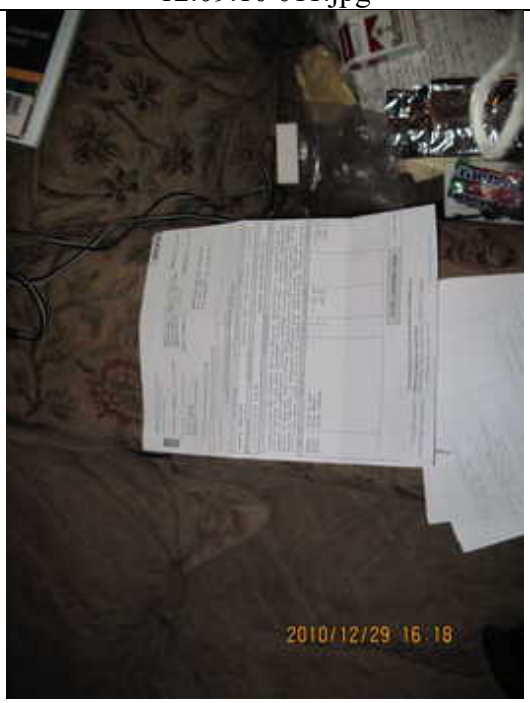
12.09.10 008.jpg

12.09.10 009.jpg

12.09.10 010.jpg

12.09.10 011.jpg

12.29.10 020.jpg



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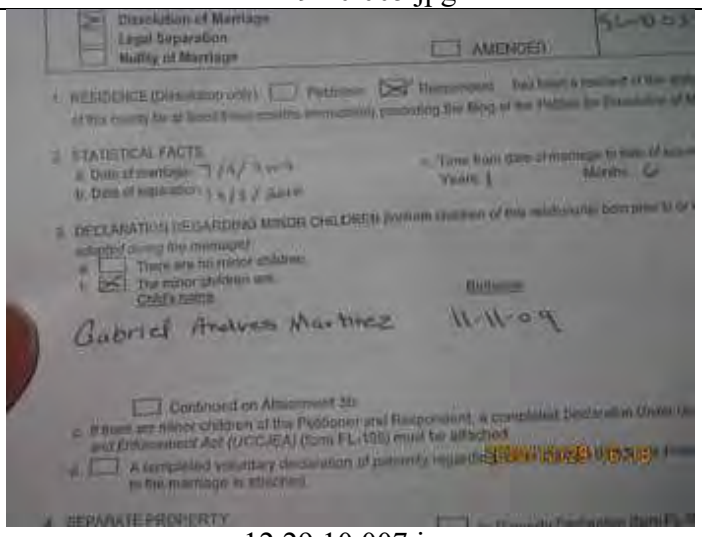

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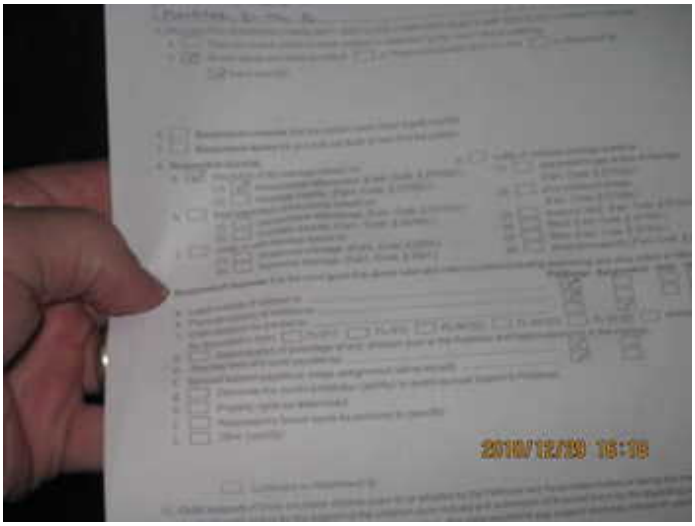
12.29.10 006.jpg



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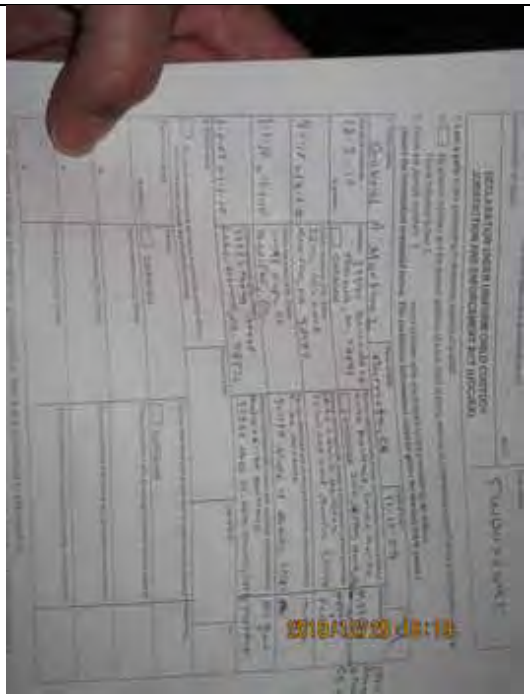

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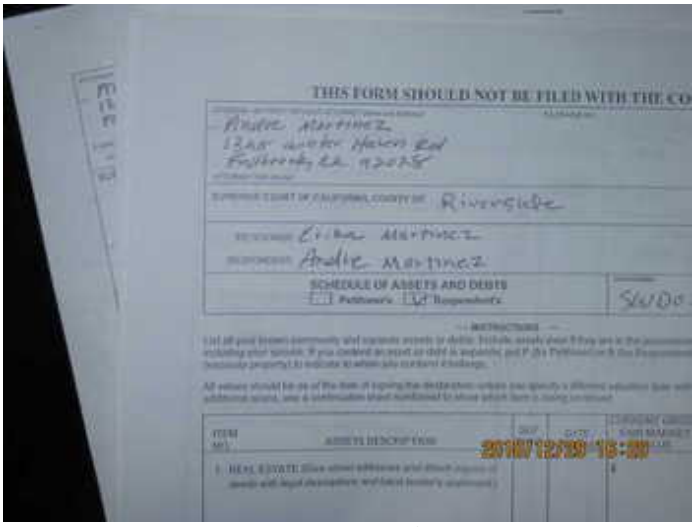

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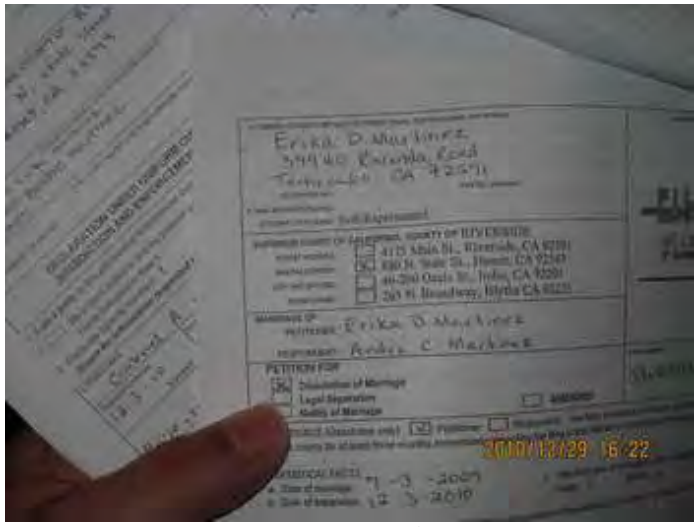

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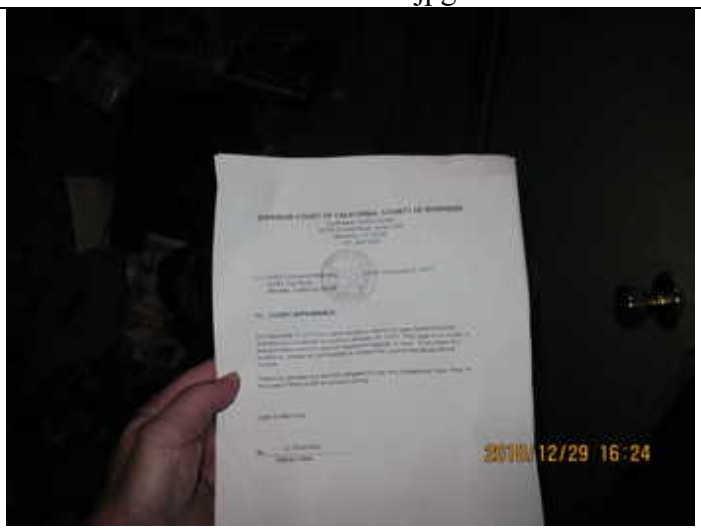

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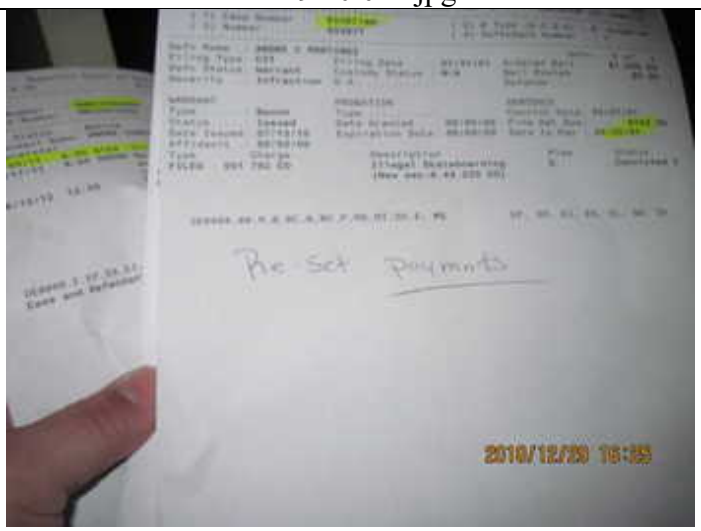
12.29.10 013.jpg



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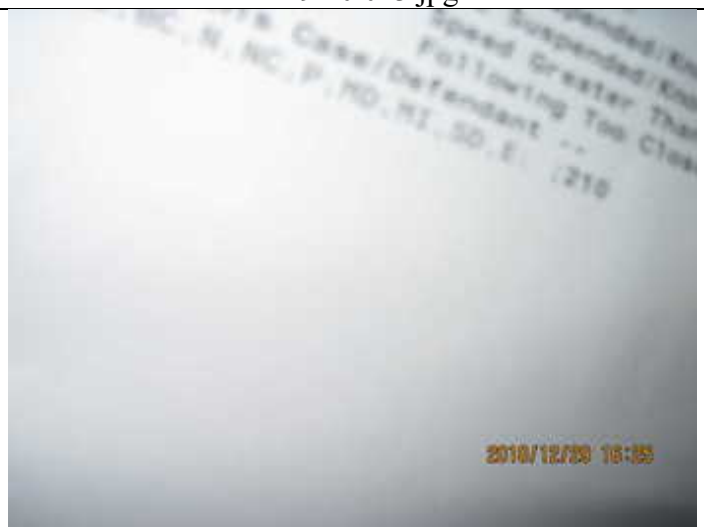
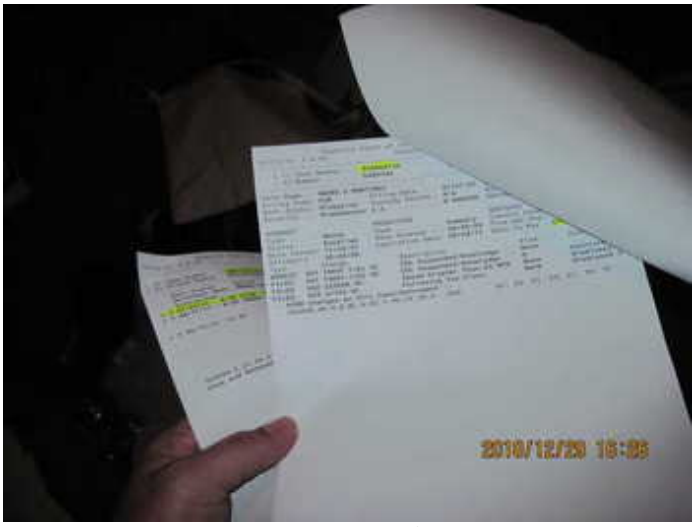


12.29.10 015.jpg

12.29.10 016.jpg



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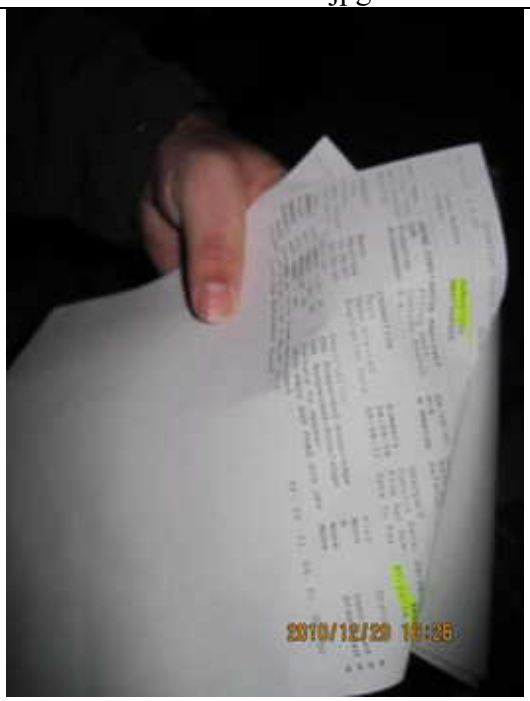

12.29.10 019.jpg

APPENDIX G

PROJECT PERSONNEL QUALIFICATIONS

Shilpa Sunil

Environmental
Project Manager

EDUCATION:

M.S. Environmental Engineering
University of California, Irvine

B.S. Environmental Engineering
University of Mysore (SJCE), Mysore, India

CERTIFICATIONS:

OSHA/ 10-hr Certification

CEQA Certification

YEARS OF EXPERIENCE:

With Hillmann: 1 years

Total: 9 years

PROFESSIONAL EXPERIENCE:

Ms. Sunil is an Environmental Professional with 9 years of experience in Environmental Engineering. Ms. Sunil is experienced in supporting several areas of Hillmann's practice including coordination of projects, project scope creation, investigatory projects, and corrective plan implementation.

As an Environmental Project Manager, Ms. Sunil has experience writing reports for site remediation for commercial property owners and preparing respective groundwater monitoring reports. She also writes Phase I and Phase II Environmental Site Assessments and Investigation reports as well as Supplemental Site Investigation Reports. She has experience working in a variety of buildings including multifamily residential properties, commercial office buildings, retail shopping centers, gasoline service stations, hotels, dry cleaning plants, auto repair shops, industrial buildings, aerospace manufacturers, plating facilities, and various manufacturing operations.

Representative experience includes:

Environmental Engineer, John L. Hunter and Associates, Inc: From 2015 to 2017, Ms. Sunil worked as an Environmental Engineer for John L. Hunter and Associates. Her responsibilities included reviewing Water Quality Management Plans, grading & drainage plans and conducting site verification inspections. She reviewed Standard Urban Storm Water Mitigation Plans; utilized SWRCB SMARTS database, assisted in Industrial Waste Plan review. She performed detailed review of grading plans, design specifications, hydro modifications analysis, and Storm Water Best Management Practice (BMP) calculations. She assisted with annual report preparation as part of NPDES permit requirements. Additionally, Ms. Sunil was responsible for reviewing work of private Professional Engineers for compliance with City standards and she assisted in determining engineering requirements for new developments.

Engineering Tech II, Orange County Public Works- OC Engineering: From July 2013 to December 2014, Ms. Sunil worked as an Engineer for Orange County Public Works. In this position, she reviewed permits requests, provided support of capital improvement and maintenance projects, and integrated environmental values into capital improvement projects by verifying the implementation of the federal National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

Staff Aid II, Orange County Public Works- OC Road, Capital Projects: From July 2012- July 2013, Ms. Sunil served as a Staff Aid for Orange County. In this position, she was responsible for the preparation of Water Quality Management Plans and Micro Station Drafting. She provided detailed review of grading plans, design specifications, hydro modification analysis, and Storm Water Best Management Practice Calculations. She assisted with annual report preparation as part of NPDES permit requirements.

Staff Aid II, Orange County Road, Traffic Engineering: From March 2010 to July 2012, Ms. Sunil was a Staff Aid for the Orange County Road and Traffic Engineering team. She performed traffic investigation, assisted the traffic committee and aided in work order preparation. She analyzed traffic flows, parking issues, and intersection capacities. Ms. Sunil provided written and verbal responses to residents of unincorporated Orange County.

Assistant Engineer, RBF Consulting, Irvine, CA: From August 2007 to January 2010, Ms. Sunil was an Assistant Engineer at RBF Consulting where she conducted comprehensive evaluations of watersheds including National Pollution Discharge Elimination Systems (NPDES) compliance, incorporated BMPs, assisted public and private sector clients with NPDES compliance services, and prepared and reviewed Storm Water Pollution Prevention Plans and Water Quality Management Plans.

J. Ryan Terwilliger

Operational Manager, West Coast

EDUCATION:

B.S. Environmental Science, University of Southern California, Los Angeles, CA

CERTIFICATION:

Cal-OSHA Certified Asbestos Consultant
CDPH Accredited Lead Inspector/Assessor/ Project Monitor

CA Certified Site Surveillance Technician

OSHA 40 - Hr HAZWOPER

YEARS OF EXPERIENCE:

With Hillmann: 4 years

Total: 8 years

PROFESSIONAL EXPERIENCE:

Mr. Terwilliger is responsible for business operations, fiscal management and field staff management for Hillmann's California Office. He also performs asbestos surveys and investigations to identify asbestos and lead materials associated with occupational hazards. He supervises work practices and controls in accordance with job specifications, current EPA, OSHA and State Regulations for Asbestos remediation projects in commercial, industrial and multi-family residential buildings. Mr. Terwilliger performs IAQ, mold and moisture investigations in commercial, industrial and residential facilities nationwide. He also performs awareness training for asbestos, lead and microbial agents. Mr. Terwilliger provides litigation support consultation.

Representative Experience Includes:

Tishman Speyer Properties, Various locations: Hillmann has provided the complete environmental program for Tishman Speyer's properties since 1987. Our services include environmental health and safety, industrial hygiene, phase I environmental site assessments, asbestos surveys, air monitoring, bid administration, O&M programs and indoor air quality programs on various commercial, industrial and multi-family residential properties. Mr. Terwilliger is an Environmental Scientist on this contract, conducting on-site environmental services including phase I site assessments and NPDES water quality testing.

Westfield – Environmental Program, Various locations: Since 2000, Hillmann has been providing an environmental program encompassing environmental health and safety, Phase I environmental site assessments, asbestos and lead surveys, air monitoring, bid administration and O&M programs, industrial hygiene and indoor air quality programs, and hazardous materials assessments on their mall properties throughout the county. Mr. Terwilliger is an Environmental Scientist on this contract performing industrial hygiene services that include indoor air quality monitoring, Phase I environmental site assessments, asbestos and lead surveys.

Brookfield Office Properties, Various sites, CA: Hillmann has been providing hazardous materials surveys, development abatement specifications, and managing the oversight activities during the abatement at various Brookfield owned sites throughout California. Mr. Terwilliger functions as a Project Manager for this contract.

California Department of Transportation, Central Valley and Northern CA: Hillmann has been performing asbestos and Lead-based Paint Surveys for the California Department of Transportation. Performed comprehensive asbestos containing materials and lead-based paint surveys of residential and commercial buildings that were slated for demolition and generated report of findings in order to aid the Department of Transportation (DOT) in facilitating the road improvement programs and building renovations throughout the

Central Valley area. Also during the abatement of asbestos from DOT owned buildings, provided contractor oversight and air monitoring services for regulatory compliance.

Verizon, Various Sites, CA. Hillmann conducted hazardous materials surveys, development abatement specifications, and project monitoring during abatement at various Verizon owned sites throughout California. Mr. Terwilliger functioned as the Project Manager.

Public Storage, Los Angeles, CA: Hillman preformed comprehensive asbestos, lead-based paint and universal waste materials survey of commercial and industrial buildings throughout Southern California. Hazardous materials surveys were conducted prior to renovation for the storage units. Mr. Terwilliger developed abatement specifications and managed the abatement activities during the renovations of the buildings. He functioned as the Project Manager on this contract.

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Appendix I. Golden Meadows Fair Share Assessment

June 13, 2022

Mr. Alen Estrada-Rodas
Placeworks
3 MacArthur Place, Suite 1100
Santa Ana, CA 92707

GOLDEN MEADOWS (TTM NO. 31194) FAIR SHARE ASSESSMENT

Mr. Alen Estrada-Rodas,

Urban Crossroads, Inc. is pleased to provide the following Fair Share Assessment for Golden Meadows (Tentative Tract Map No. 31194) development (referred to as **Project**) which is located north of Wickerd Road and south of Garbani Road in the City of Menifee. In order to support the City in conditioning the Project, the purpose of this assessment is to provide rough order of magnitude (ROM) estimates for fair share contributions to the City of Menifee (or other applicable agency) for the 16 deficient off-site intersections identified in the Tentative Tract 31194 Traffic Impact Analysis (dated May 24, 2004, referred to as **2004 Traffic Study**) for the proposed Project where fair share contributions would be applicable.

PROPOSED PROJECT

The Project is proposed to consist of up to 571 single family detached residential dwelling units.

TRIP GENERATION

The trip generation rates used for this analysis are based upon information collected by the Institute of Transportation Engineers (ITE) as provided in their Trip Generation Manual (11th Edition, 2021) for the proposed single family detached residential use (ITE Land Use Code 210) (see Table 1). The trip generation summary illustrating daily, and peak hour trip generation estimates for the proposed Project is also shown on Table 1. As shown on Table 1, the proposed Project is anticipated to generate a total of 5,386 trip-ends per day with 400 AM peak hour trips and 537 PM peak hour trips.

TABLE 1: PROPOSED PROJECT TRIP GENERATION SUMMARY

Land Use[1]	ITE Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Single Family Detached Residential	220	DU	0.18	0.52	0.70	0.59	0.35	0.94	9.43

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Eleventh Edition (2021).

[2] DU = dwelling units

Project	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Golden Meadows (TTM No. 31194)	571	DU	104	296	400	338	199	537	5,386

[1] DU = dwelling units

WICKERD ROAD CLASSIFICATION

In order to determine the ultimate roadway classification for the portion of Wickerd Road bisecting the development, the long-range future traffic forecasts assuming buildout of the City were reviewed. General Plan Buildout with Project daily traffic volumes are shown on Exhibit 1. As shown on Exhibit 1, the volumes along Wickerd Road are no more than 9,000 vehicles per day. Due to the low volume anticipated, it was determined that a "collector" roadway would be sufficient to accommodate the anticipated future traffic volume (which has a daily volume capacity of 13,000 vehicles per day). It is recommended that the portion of Wickerd Road through the development be designed and constructed to accommodate a modified industrial collector cross-section, which has a curb-to-curb width of 56-feet (accommodates two 10-foot shoulders, two 12-foot through lanes, and a 12-foot painted median/left turn lane). In addition, there would be two 12 to 21-foot-wide sidewalk/parkway areas which results in an ultimate right-of-way of 98-feet.

EXHIBIT 1: GENERAL PLAN BUILDOUT WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)

TRAFFIC SIGNAL WARRANT ANALYSIS

The term "signal warrants" refers to the list of established criteria used by the Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This assessment uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices *(CA MUTCD)*. The Peak Hour Volume-based Warrant 3 is the appropriate representative traffic signal warrant analysis for existing study area intersections. Warrant 3 is appropriate to use because it provides specialized warrant criteria for intersections with rural characteristics (e.g., located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour).

A traffic signal warrant analysis has been conducted for the intersection of Haun Road and Wickerd Road to determine when a traffic signal would be warranted at this location. Based on the traffic signal warrant analysis, the intersection of Haun Road and Wickerd Road would

warrant a traffic signal after the 275th dwelling unit. Attachment B includes the traffic signal warrants at existing conditions, up to 275 dwelling units, and at Project Buildout.

REGIONAL AND LOCAL FUNDING MECHANISMS

Transportation improvements within the City of Menifee are funded through a combination of improvements constructed by the Project, development impact fee programs or fair share contributions. Fee programs applicable to the Project are described below.

RIVERSIDE COUNTY TRANSPORTATION UNIFORM MITIGATION FEE (TUMF)

The Transportation Uniform Mitigation Fee (TUMF) program is administered by the Western Riverside Council of Governments (WRCOG) based upon a regional Nexus Study most recently updated in 2016 to address major changes in right of way acquisition and improvement cost factors. This regional program was put into place to ensure that development pays its fair share, and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region. TUMF is a truly regional mitigation fee program and is imposed and implemented in every jurisdiction in Western Riverside County. The proposed Project is located within the Central TUMF Zone.

CITY OF MENIFEE DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The Project will also be subject to City of Menifee's DIF program which includes a component for roads and signals. The City's DIF program has been updated in July 2021 and discusses the local (as opposed to regional) streets and signal improvements planned for the City through build-out of the existing City limits.

SCOTT ROAD AND BRIDGE BENEFIT DISTRICT (RBBD)

The City of Menifee is anticipated to experience substantial growth. Extensive improvements are necessitated by new development within the region. In particular, Riverside County recognized the effects of this growth on the vicinity of the study area when it formed the Scott Road RBBD. The proposed Project lies within Zone B of the Scott Road RBBD. Zone B is generally bounded by the I-215 Freeway to the east, Sunset Avenue to the west, Holland Road to the north, and Baxter Road to the south. As discussed above, the facilities improvements that will be ultimately constructed as a result of the collection of these fees and assessments.

FAIR SHARE CONTRIBUTION

Project improvements may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements found to be included in the TUMF, DIF, and/or the Scott Road RBBD will be identified as such. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City's discretion). These fees are collected with the proceeds

solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases.

For improvements that do not appear to be in any of the pre-existing fee programs or constructed by the Project, a fair share contribution based on the Project's proportional share may be imposed in order to address the Project's share of deficiencies in lieu of construction. It should be noted that fair share calculations are for informational purposes only and the City Traffic Engineer will determine the appropriate improvements to be implemented by a project (to be identified in the conditions of approval). Per the City of Menifee traffic study guidelines, all fair share contributions shall be calculated using the following equation:

Fair Share Percentage = Proposed Project Trips / [(Future Volumes – Existing Volumes)]

Detailed fair share calculations, for each peak hour, have been provided on Table 2 for the applicable study area intersections. The proposed Project trips are based on the current trip generation and the distribution identified in the 2004 Traffic Study. Data from the 2004 Traffic Study are also shown on Table 2, which includes the Post 2025 With Project traffic volumes. Existing traffic volumes have been derived from 2019, 2020, 2021, and 2022 traffic counts or have been estimated based on the observed growth between 2004 and the current traffic counts for near-by intersections. Consistent with the City's Guidelines, the updated Project fair share percentage for each intersection has been determined by dividing the currently proposed Project volume by the Total New Traffic, where Total New Traffic is Future Year traffic less Existing traffic. The resulting fair share percentages for the proposed Project are shown in the column on the far right. Excerpts from the Traffic Study are included in Attachment A. The fair share cost shall be determined at a future date based on engineering cost estimates of the proposed improvements in conjunction with the fair share percentages identified in Table 2.

If you have any questions or comments, I can be reached at (949) 861-0177.

Respectfully submitted,

URBAN CROSSROADS, INC.

Charlene So

Charlene So, PE
Principal

TABLE 2: PROJECT FAIR SHARE CALCULATIONS

#	Intersection		Existing	Proposed Project	Future Year	Total New Traffic[1]	Project Fair Share[2]
1	Murrieta Rd. & Holland Rd.						
		AM:	2,488	40	3,510	1,022	**3.91%**
		PM:	1,442	54	4,440	2,998	1.80%
2	Murrieta Rd. & Garbani Rd.						
		AM:	2,896	100	4,136	1,240	**8.06%**
		PM:	1,374	135	2,887	1,513	8.92%
3	Murrieta Rd. & Scott Rd.						
		AM:	2,500	60	4,000	1,500	**4.00%**
		PM:	2,491	81	5,108	2,617	3.09%
4	Evans Rd. & Garbani Rd.						
		AM:	663	120	1,986	1,323	9.07%
		PM:	137	162	2,271	2,134	**7.59%**
5	Evans Rd. & Scott Rd.						
		AM:	2,003	0	3,889	1,886	0.00%
		PM:	2,301	0	4,582	2,281	0.00%
6	Garbani Rd. & Wickerd Rd.						
		AM:	18	179	1,611	1,593	11.24%
		PM:	7	241	1,762	1,755	**13.73%**
7	Haun Rd. & Newport Rd.						
		AM:	4,919	80	6,368	1,449	**5.52%**
		PM:	5,914	108	8,628	2,714	3.98%
8	Haun Rd. & Holland Rd.						
		AM:	1,782	80	4,367	2,585	**3.10%**
		PM:	1,046	108	5,608	4,562	2.37%
9	Haun Rd. & Craig Av.						
		AM:	1,063	80	1,972	909	**8.80%**
		PM:	584	108	2,598	2,014	5.36%
10	Haun Rd. & Garbani Rd.						
		AM:	1,063	139	3,398	2,335	5.95%
		PM:	584	188	4,040	3,456	**5.44%**
11	Haun Rd. & Wickerd Rd.[3]						
		AM:	1,226	220	2,059	833	**26.41%**
		PM:	1,300	296	2,599	1,299	22.79%
12	Haun Rd. & Scott Rd.						
		AM:	1,575	120	5,367	3,792	**3.16%**
		PM:	1,534	161	7,149	5,615	2.87%
13	I-215 SB Ramps & Newport Rd.						
		AM:	5,649	80	7,315	1,666	**4.80%**
		PM:	6,066	108	9,026	2,960	3.65%
14	I-215 SB Ramps & Scott Rd.						
		AM:	3,484	120	5,703	2,219	**5.41%**
		PM:	3,487	161	7,919	4,432	3.63%
15	I-215 NB Ramps & Newport Rd.						
		AM:	5,475	59	7,677	2,202	**2.68%**
		PM:	6,165	40	9,403	3,238	1.24%
16	I-215 NB Ramps & Scott Rd.						
		AM:	3,178	46	6,192	3,014	1.53%
		PM:	4,000	112	9,729	5,729	**1.95%**

BOLD = Fair share percentage for the Project based on the highest peak hour.

[1] Total New Traffic = Future Year - Existing

[2] Project Fair Share = Proposed Project / Total New Traffic

[3] A traffic signal is anticipated to meet peak hour volume-based warrants after the 275th dwelling unit.

ATTACHMENT A: EXCERPTS FROM TENTATIVE TRACT 31194 TRAFFIC IMPACT ANALYSIS, DATED MAY 24, 2004

TENTATIVE TRACT 31194
TRAFFIC IMPACT ANALYSIS (REVISED)
COUNTY OF RIVERSIDE, CALIFORNIA

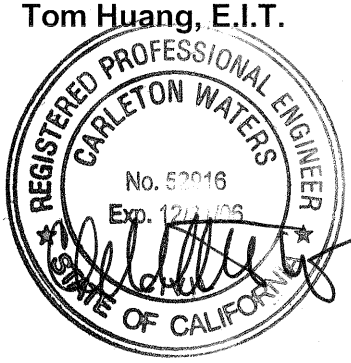
Prepared for:

Mr. Pete Evans
WOODSIDE HOMES OF CALIFORNIA, INC.
23121 Antonio Parkway, Suite 120
Rancho Santa Margarita, CA 92688

Prepared by:

URBAN CROSSROADS, INC.
41 Corporate Park, Suite 300
Irvine, CA 92606

John Kain, AICP
Scott Sato, P.E.
Tom Huang, E.I.T.

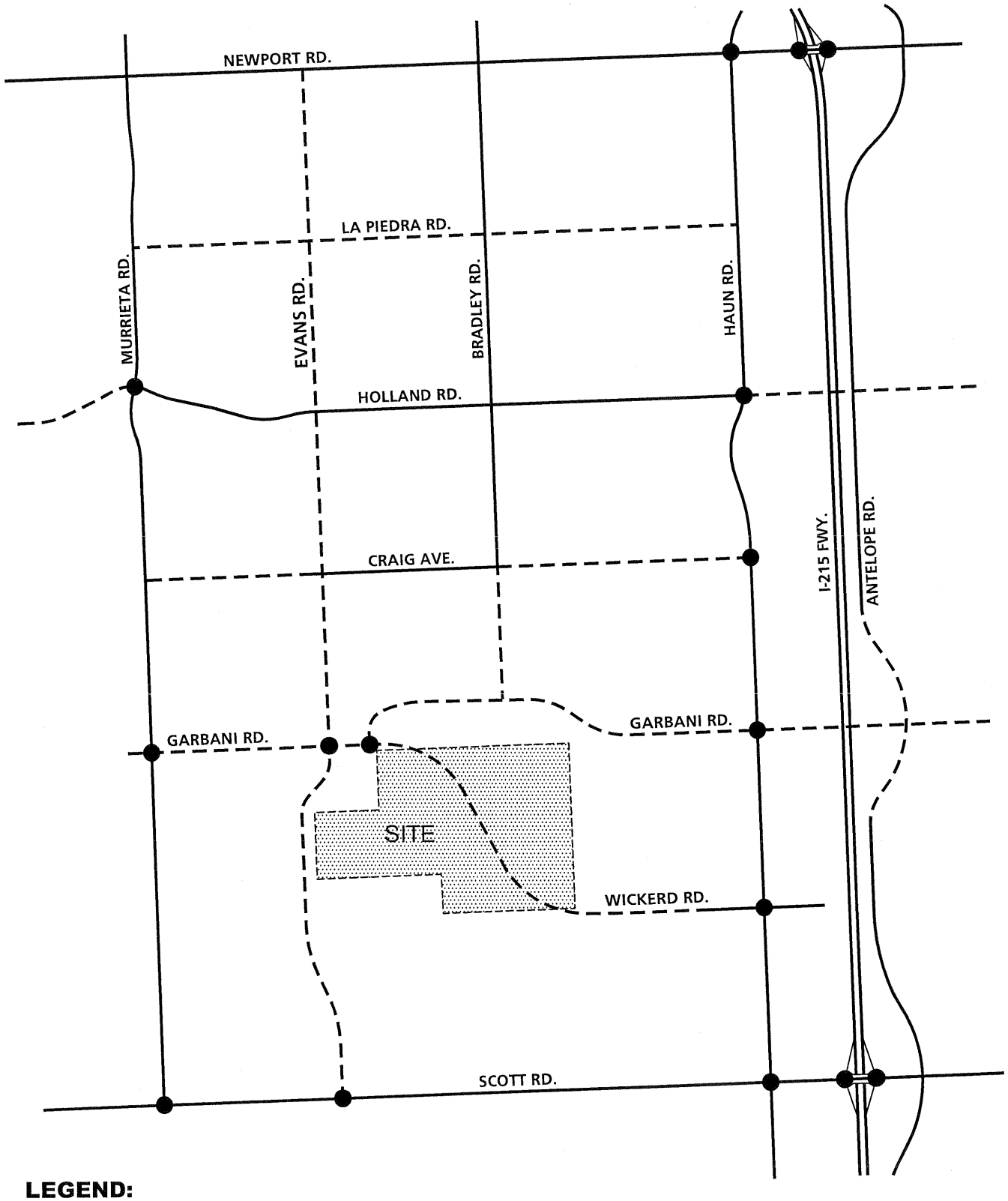


July 11, 2003
May 24, 2004 (Revised)

JN:01098-04
JK:SS:TH:js

EXHIBIT 1-A

PROJECT LOCATION MAP



LEGEND:

● = INTERSECTION ANALYSIS LOCATION

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TENTATIVE TRACT 31194, County of Riverside, California - 01098:27

TABLE 1-1 (1 of 3)

SUMMARY OF INTERSECTION IMPROVEMENTS

INTERSECTION	OPENING YEAR WITHOUT PROJECT CONDITIONS			OPENING YEAR WITH PROJECT CONDITIONS	POST 2025 TRAFFIC CONDITIONS			
	TUMF PROGRAM (RHSA NETWORK)	DIF SIGNAL MITIGATION FEE	OTHER NEEDED IMPROVEMENTS		SCOTT R&BBD (ZONE B)	TUMF PROGRAM (RHSA NETWORK)	DIF SIGNAL MITIGATION FEE	OTHER NEEDED IMPROVEMENTS
Murrieta Rd. (NS) at: • Holland Rd. (EW) - Northbound - Southbound - Eastbound - Westbound		• Traffic Signal						 • Second Through Lane • Second Through Lane • Right Turn Lane • Right-Turn Overlap Phasing • Left Turn Lane • Second Through Lane • Left Turn Lane • Second Through Lane
Murrieta Rd. (NS) at: • Garbani Rd. (EW) - Northbound - Southbound - Eastbound - Westbound		• Traffic Signal	 • Left Turn Lane • Left Turn Lane • Left Turn Lane • Left Turn Lane					 • Second Through Lane • Second Through Lane • Second Through Lane • Second Through Lane
Murrieta Rd. (NS) at: • Scott Rd. (EW) - Southbound - Eastbound - Westbound	• Traffic Signal • Left Turn Lane				 • Second Through Lane • Second Through Lane	• Left Turn Lane • Right-Turn Overlap Phasing • Second Left Turn Lane • Third Through Lane • Third Through Lane		
Evans Rd. (NS) at: • Garbani Rd. (EW) - Northbound - Southbound - Eastbound - Westbound							• Traffic Signal	 • Left Turn Lane • Left Turn Lane • Left Turn Lane • Second Through Lane • Left Turn Lane • Second Through Lane
Evans Rd. (NS) at: • Scott Rd. (EW) - Eastbound - Westbound							• Traffic Signal	 • Left Turn Lane • Second Through Lane • Second Through Lane
Garbani Rd. (NS) at: • Wickerd Rd. (EW) - Southbound - Eastbound - Westbound							• Traffic Signal	 • Right Turn Lane • Left Turn Lane • Left Turn Lane

TABLE 1-1 (2 of 3)

SUMMARY OF INTERSECTION IMPROVEMENTS

INTERSECTION	OPENING YEAR WITHOUT PROJECT CONDITIONS			OPENING YEAR WITH PROJECT CONDITIONS	POST 2025 TRAFFIC CONDITIONS			
	TUMF PROGRAM (RHSA NETWORK)	DIF SIGNAL MITIGATION FEE	OTHER NEEDED IMPROVEMENTS		SCOTT R&BBD (ZONE B)	TUMF PROGRAM (RHSA NETWORK)	DIF SIGNAL MITIGATION FEE	OTHER NEEDED IMPROVEMENTS
Haun Rd. (NS) at: • Newport Rd. (EW) - Northbound - Eastbound - Westbound						• Third Through Lane		• Second Left Turn Lane • Free-Right Turn Lane • Second Left Turn Lane
Haun Rd. (NS) at: • Holland Rd. (EW) - Northbound - Southbound - Eastbound - Westbound		• Traffic Signal	• Left Turn Lane • Left Turn Lane • Left Turn Lane • Left Turn Lane					• Second Through Lane • Right Turn Lane • Right-Turn Overlap Phasing • Second Through Lane • Second Through Lane • Second Through Lane • Right Turn Lane
Haun Rd. (NS) at: • Craig Ave. (EW) - Northbound - Southbound - Eastbound							• Traffic Signal	• Left Turn Lane • Second Through Lane • Second Through Lane • Left Turn Lane
Haun Rd. (NS) at: • Garbani Rd. (EW) - Northbound - Southbound - Eastbound - Westbound					• Left Turn Lane • Second Through Lane • Left Turn Lane • Second Through Lane • Right Turn Lane • Right-Turn Overlap Phasing		• Traffic Signal	• Left Turn Lane • Second Through Lane • Right Turn Lane • Right-Turn Overlap Phasing • Left Turn Lane • Second Through Lane
Haun Rd. (NS) at: • Wickerd Rd. (EW) - Northbound - Southbound - Eastbound - Westbound				• Traffic Signal • Left Turn Lane • Left Turn Lane • Left Turn Lane • Left Turn Lane				• Second Through Lane • Second Through Lane

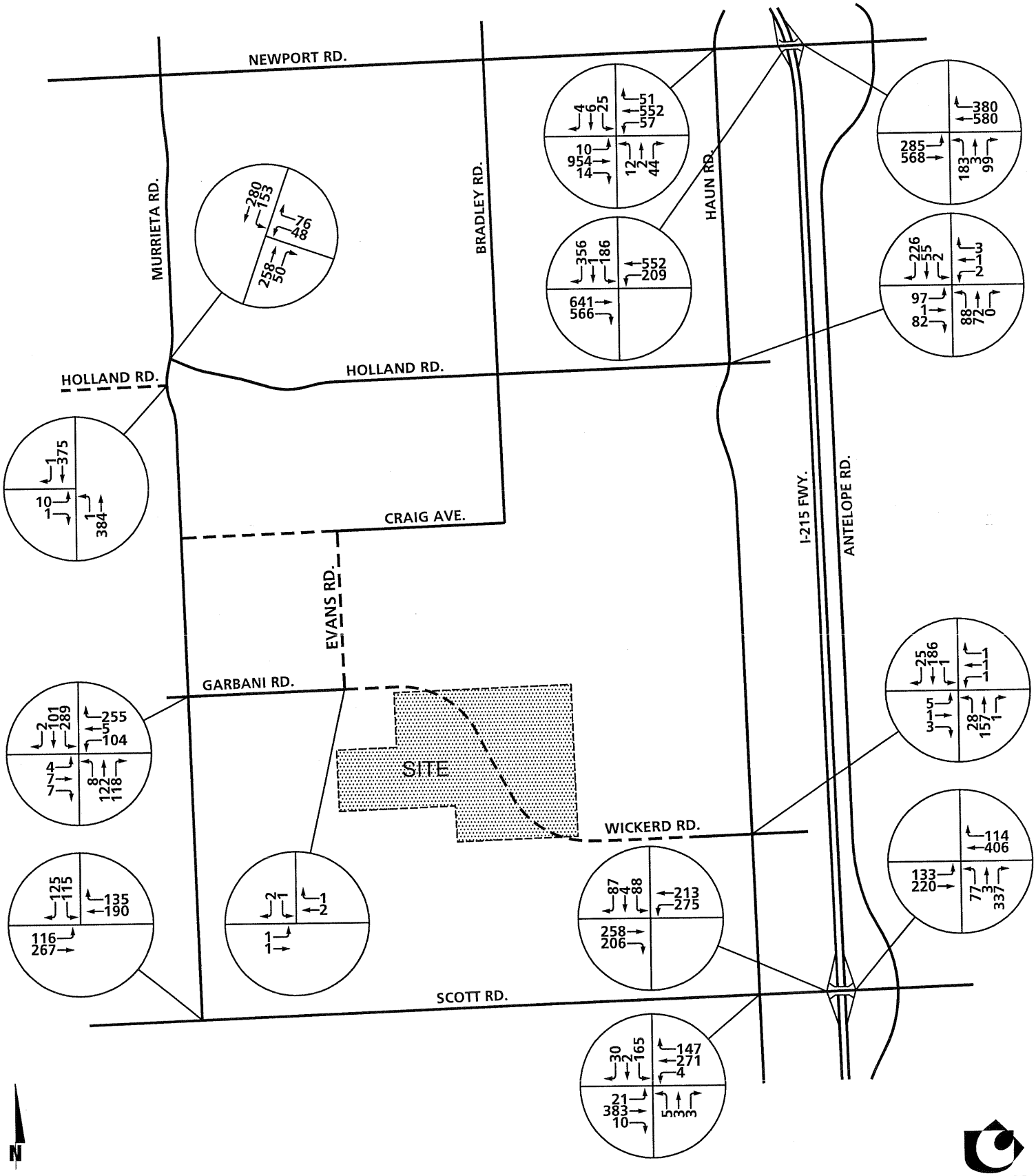
TABLE 1-1 (3 of 3)

SUMMARY OF INTERSECTION IMPROVEMENTS

INTERSECTION	OPENING YEAR WITHOUT PROJECT CONDITIONS			OPENING YEAR WITH PROJECT CONDITIONS	POST 2025 TRAFFIC CONDITIONS			
	TUMF PROGRAM (RHSA NETWORK)	DIF SIGNAL MITIGATION FEE	OTHER NEEDED IMPROVEMENTS		SCOTT R&BBD (ZONE B)	TUMF PROGRAM (RHSA NETWORK)	DIF SIGNAL MITIGATION FEE	OTHER NEEDED IMPROVEMENTS
Haun Rd. (NS) at: • Scott Rd. (EW) - Northbound - Southbound - Eastbound - Westbound	 • Left Turn Lane • Left Turn Lane	• Traffic Signal	 • Left Turn Lane • Left Turn Lane		 • Second Through Lane • Second Through Lane • Right Turn Lane • Right-Turn Overlap Phasing	 • Third Through Lane • Third Through Lane		 • Second Through Lane • Right Turn Lane • Right-Turn Overlap Phasing • Second Left Turn Lane • Second Through Lane
I-215 SB Ramps (NS) at: • Newport Rd. (EW) - Southbound - Eastbound - Westbound						 • Third Through Lane • Third Through Lane		 • Free-Right Turn Lane • Fourth Through Lane • Second Left Turn Lane
I-215 SB Ramps (NS) at: • Scott Rd. (EW) - Southbound - Eastbound - Westbound	• Traffic Signal				 • Left Turn Lane • Second Left Turn Lane • Second Through Lane • Second Left Turn Lane • Second Through Lane	 • Third Through Lane • Third Through Lane		 • Fourth Through Lane
I-215 NB Ramps (NS) at: • Newport Rd. (EW) - Northbound - Eastbound - Westbound						 • Third Through Lane • Third Through Lane		 • Free-Right Turn Lane • Second Left Turn Lane
I-215 NB Ramps (NS) at: • Scott Rd. (EW) - Northbound - Eastbound - Westbound	• Traffic Signal				 • Second Left Turn Lane • Free-Right Turn Lane • Second Left Turn Lane • Second Through Lane • Second Through Lane • Right Turn Lane	 • Third Through Lane • Third Through Lane		

EXHIBIT 3-E

EXISTING AM PEAK HOUR INTERSECTION VOLUMES

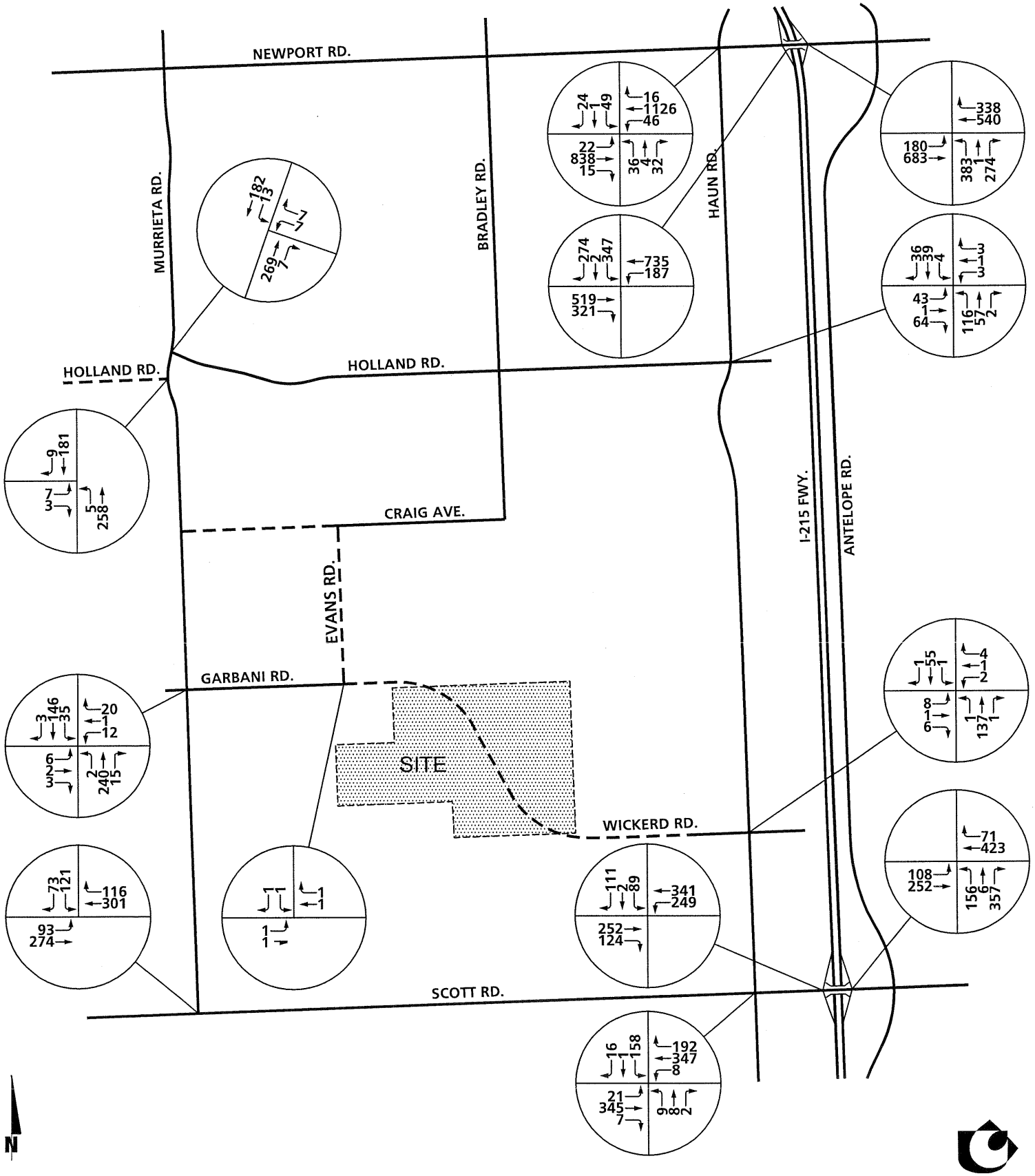


TENTATIVE TRACT 31194, County of Riverside, California - 01098:17

URBAN CROSSROADS

EXHIBIT 3-F

EXISTING PM PEAK HOUR INTERSECTION VOLUMES



TENTATIVE TRACT 31194, County of Riverside, California - 01098:18

URBAN CROSSROADS

TABLE 4-1

TRIP GENERATION RATES[1]

LAND USE	UNITS[2]	PEAK-HOUR				DAILY
		AM		PM		
		IN	OUT	IN	OUT	
Single-Family Detached Residential	DU	0.19	0.56	0.65	0.36	9.57

[1] Source: Institute of Transportation Engineers (ITE), Trip Generation, Sixth Editions, 1997, Land Use Category 210.

[2] DU = dwelling unit

TABLE 4-2

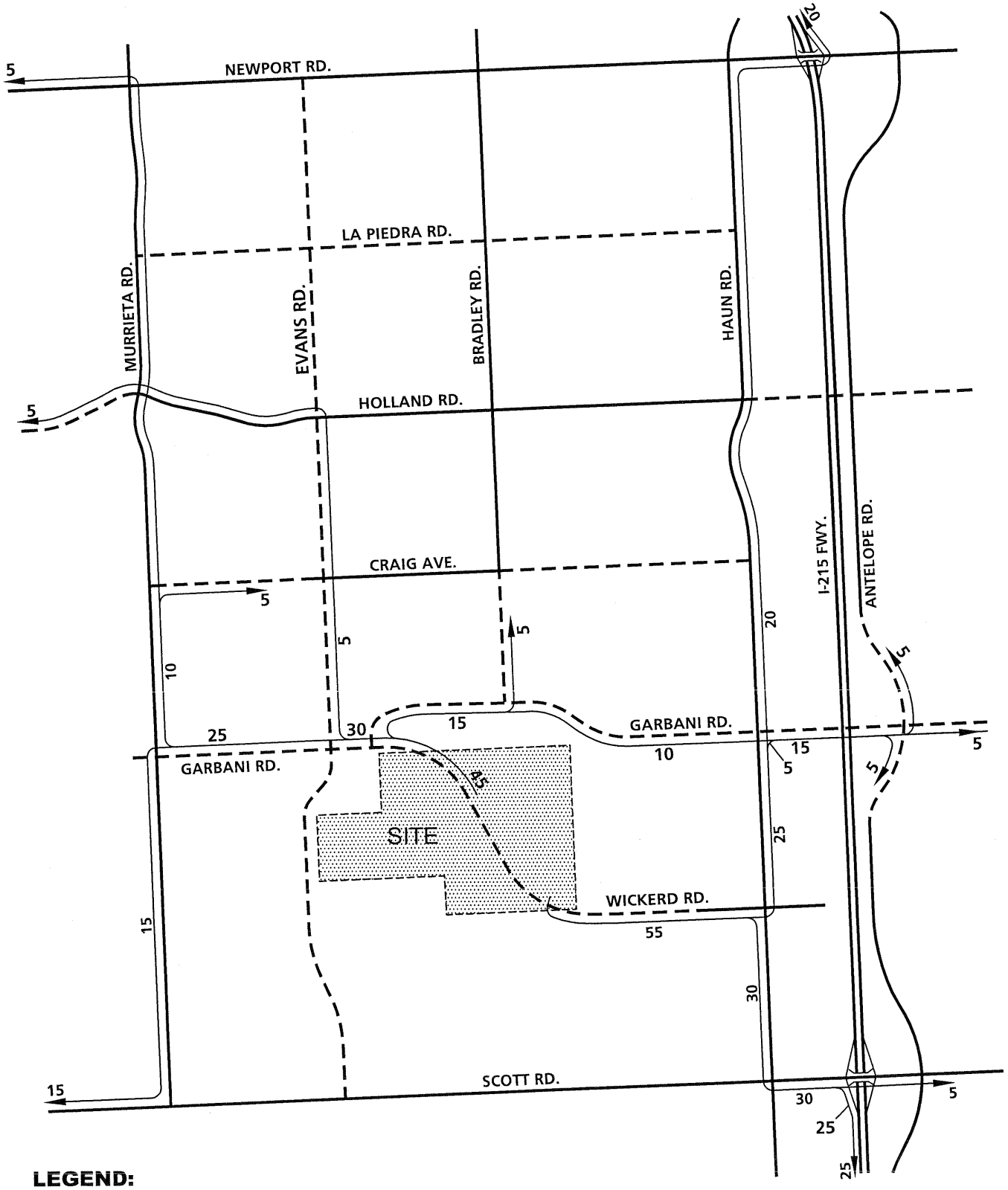
PROJECT TRIP GENERATION

LAND USE	PROPOSED QUANTITY[1]	PEAK-HOUR				DAILY
		AM		PM		
		IN	OUT	IN	OUT	
Single-Family Detached Residential	484 DU	92	271	315	174	4,632

[1] DU = dwelling unit

EXHIBIT 4-B

PROJECT (POST 2025) TRIP DISTRIBUTION



LEGEND:

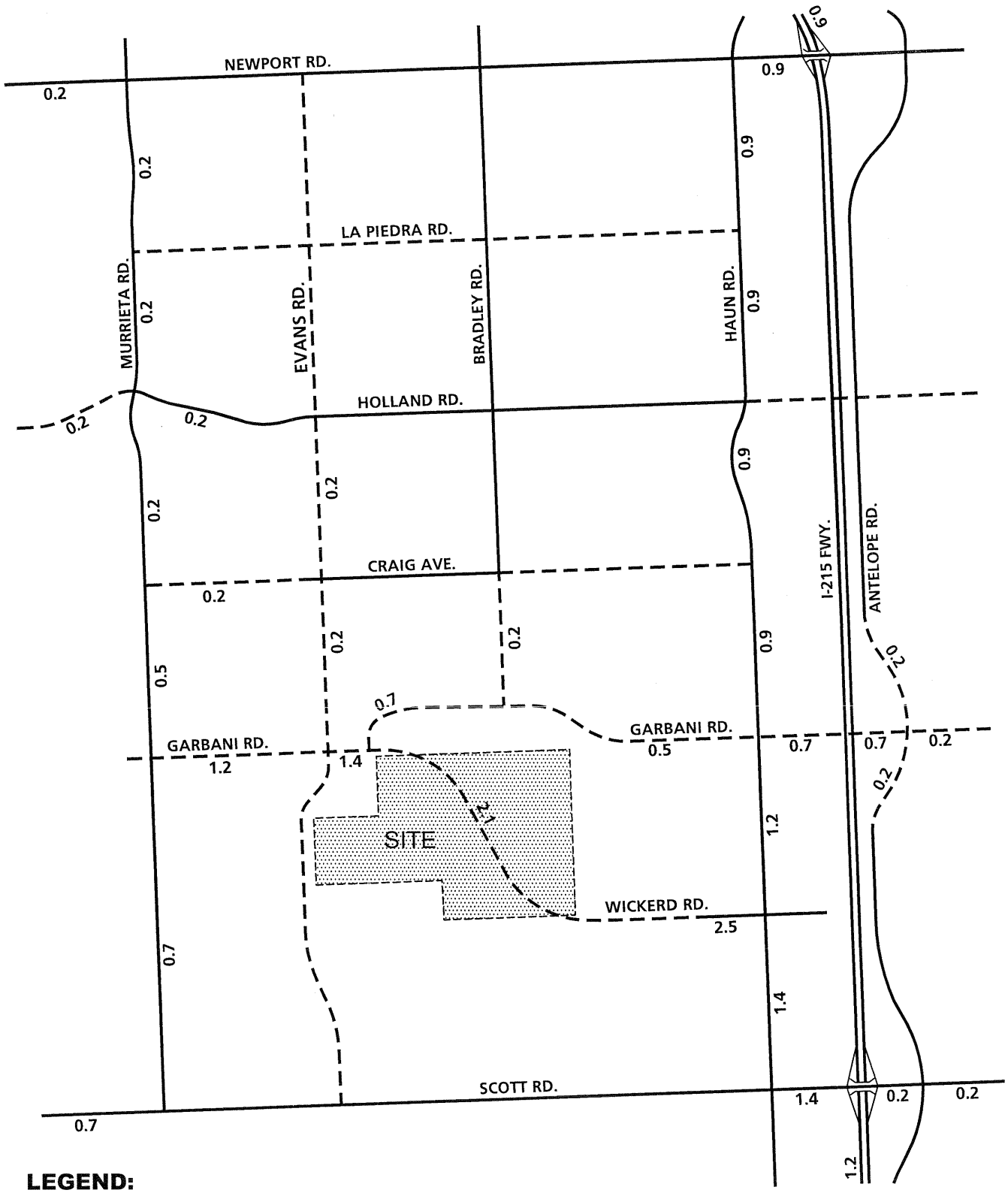
10 = PERCENT TO/FROM PROJECT

N

URBAN CROSSROADS

EXHIBIT 4-D

PROJECT (POST 2025) AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

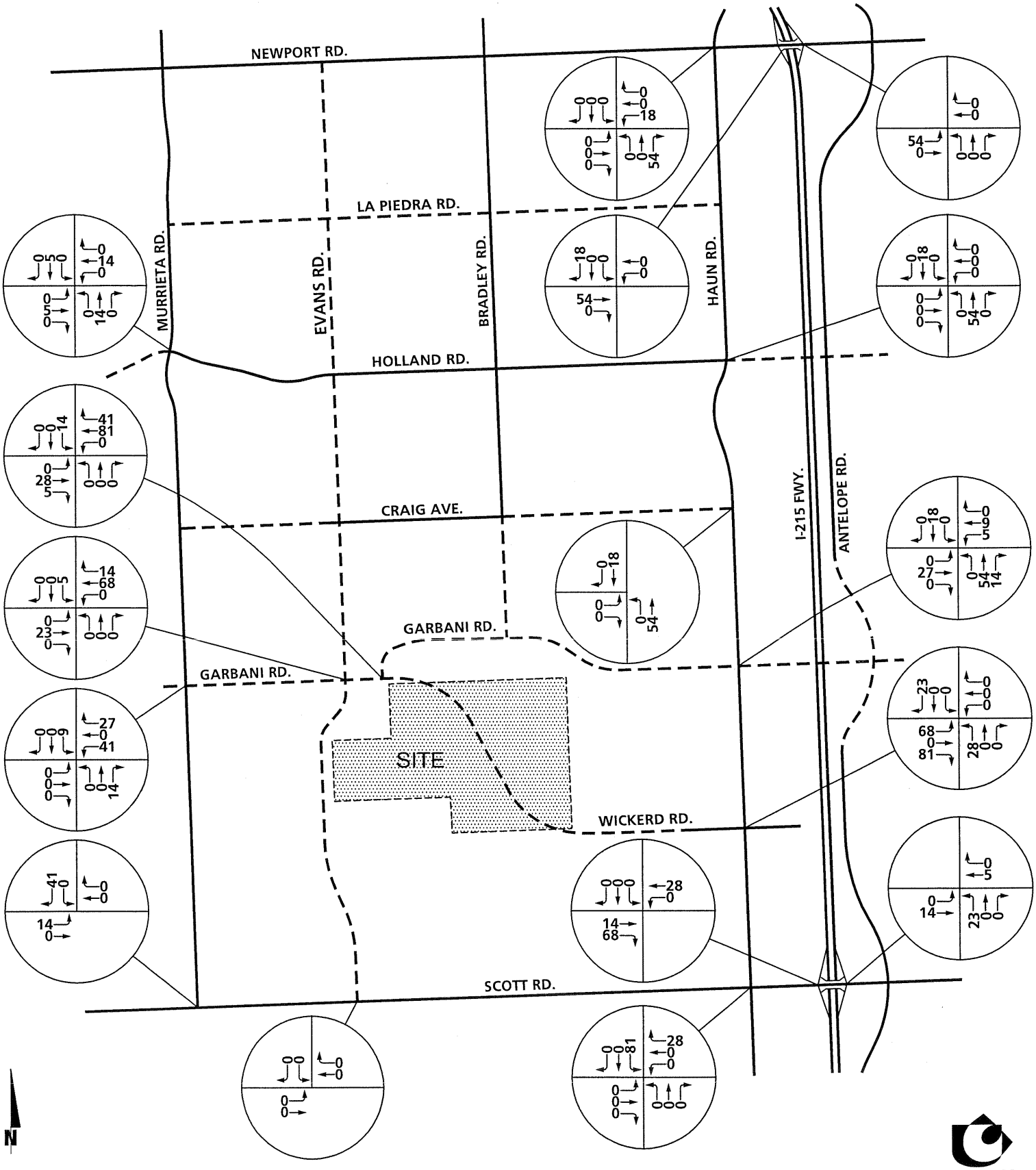
N

TENTATIVE TRACT 31194, County of Riverside, California - 01098:32

URBAN CROSSROADS

EXHIBIT 4-G

PROJECT (POST 2025) AM PEAK HOUR INTERSECTION VOLUMES

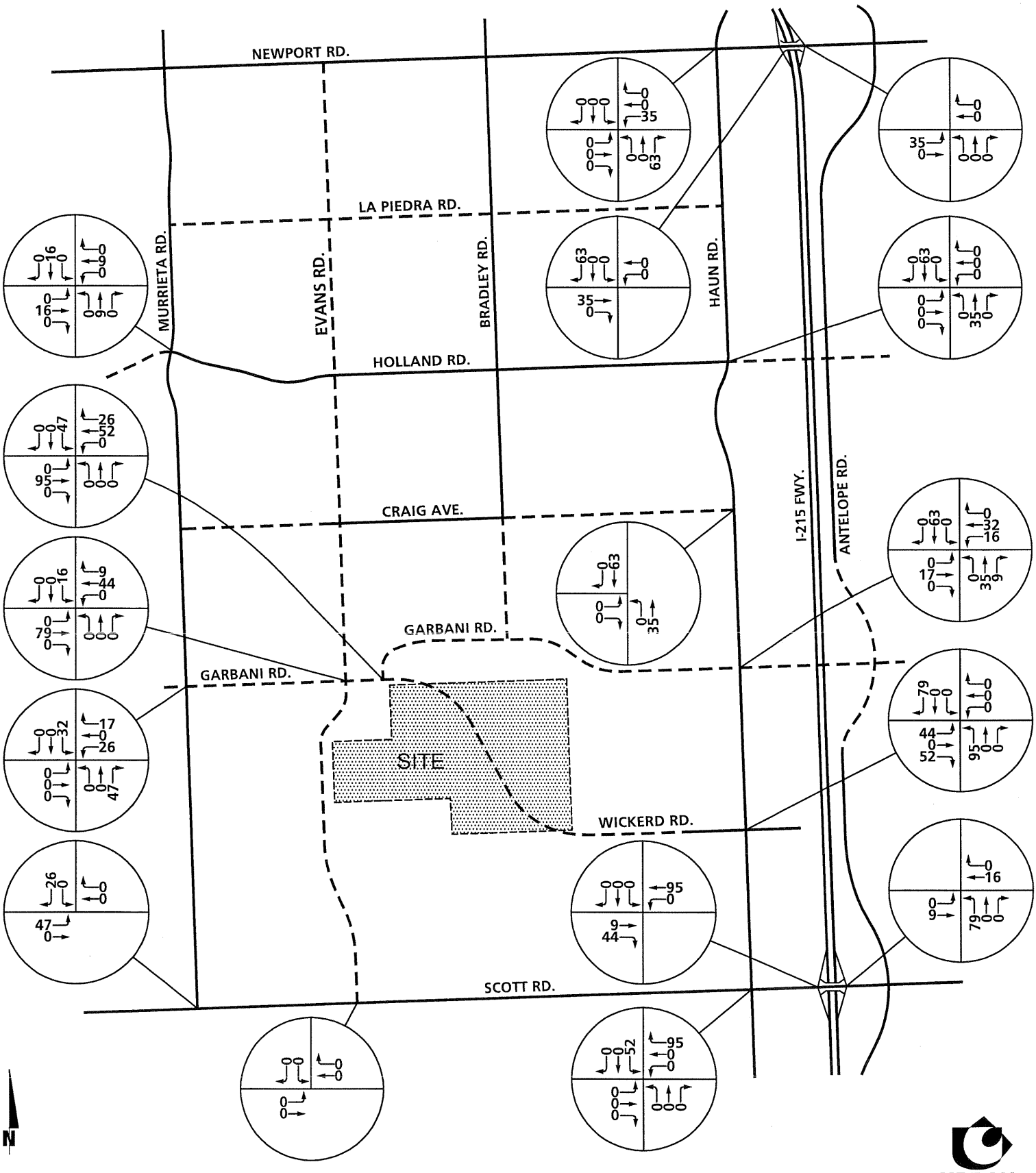


TENTATIVE TRACT 31194, County of Riverside, California - 01098:35

URBAN CROSSROADS

EXHIBIT 4-H

PROJECT (POST 2025) PM PEAK HOUR INTERSECTION VOLUMES



TENTATIVE TRACT 31194, County of Riverside, California - 01098:36

URBAN CROSSROADS

EXHIBIT 5-G

POST 2025 WITH PROJECT AM PEAK HOUR INTERSECTION VOLUMES

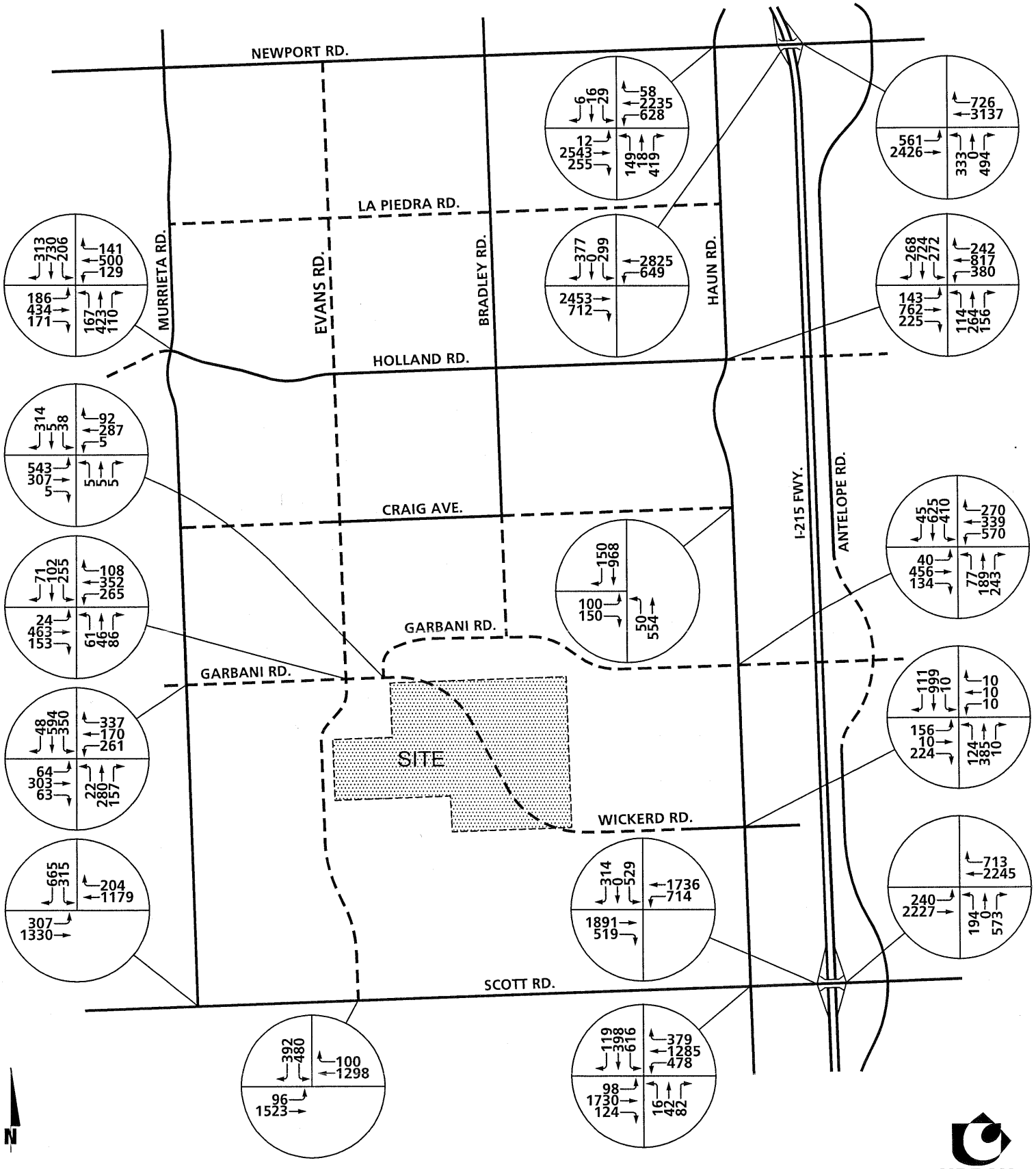
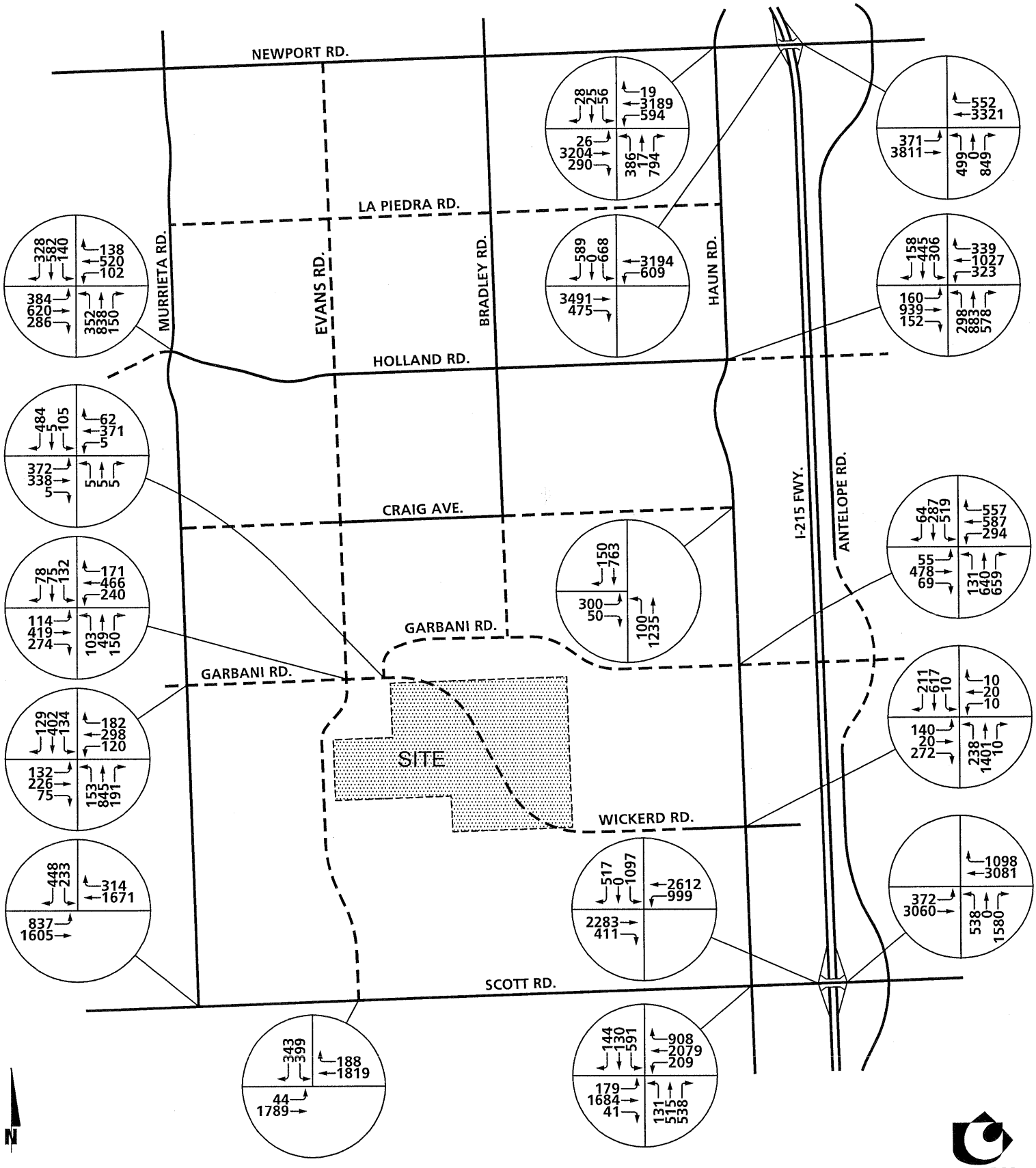


EXHIBIT 5-H

POST 2025 WITH PROJECT PM PEAK HOUR INTERSECTION VOLUMES



TENTATIVE TRACT 31194, County of Riverside, California - 01098:40

URBAN CROSSROADS

ATTACHMENT B: TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

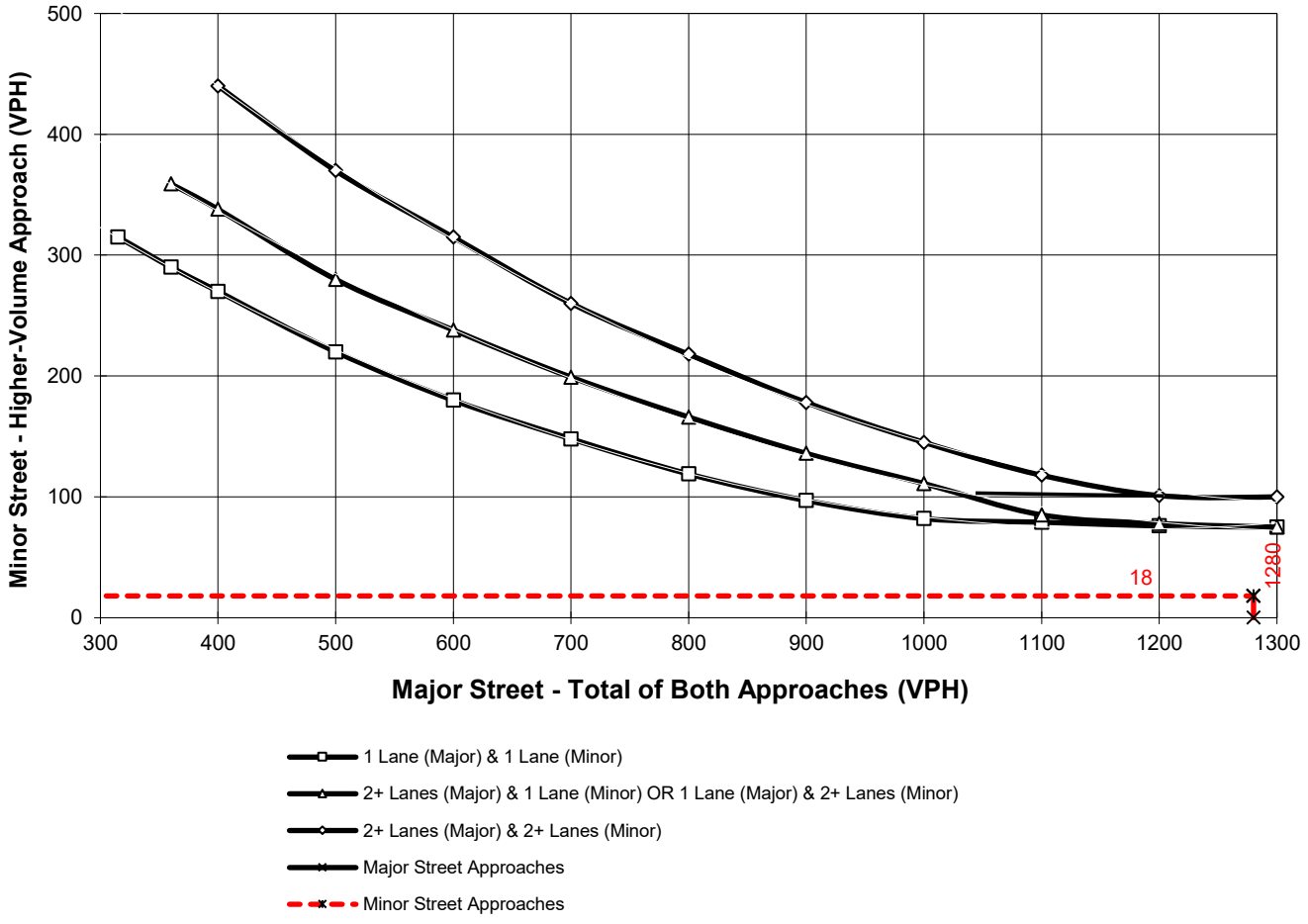
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing Conditions - Weekday PM Peak Hour**

Major Street Name = **Haun Rd.**
Total of Both Approaches (VPH) = **1280**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Wickerd Rd.**
High Volume Approach (VPH) = **18**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

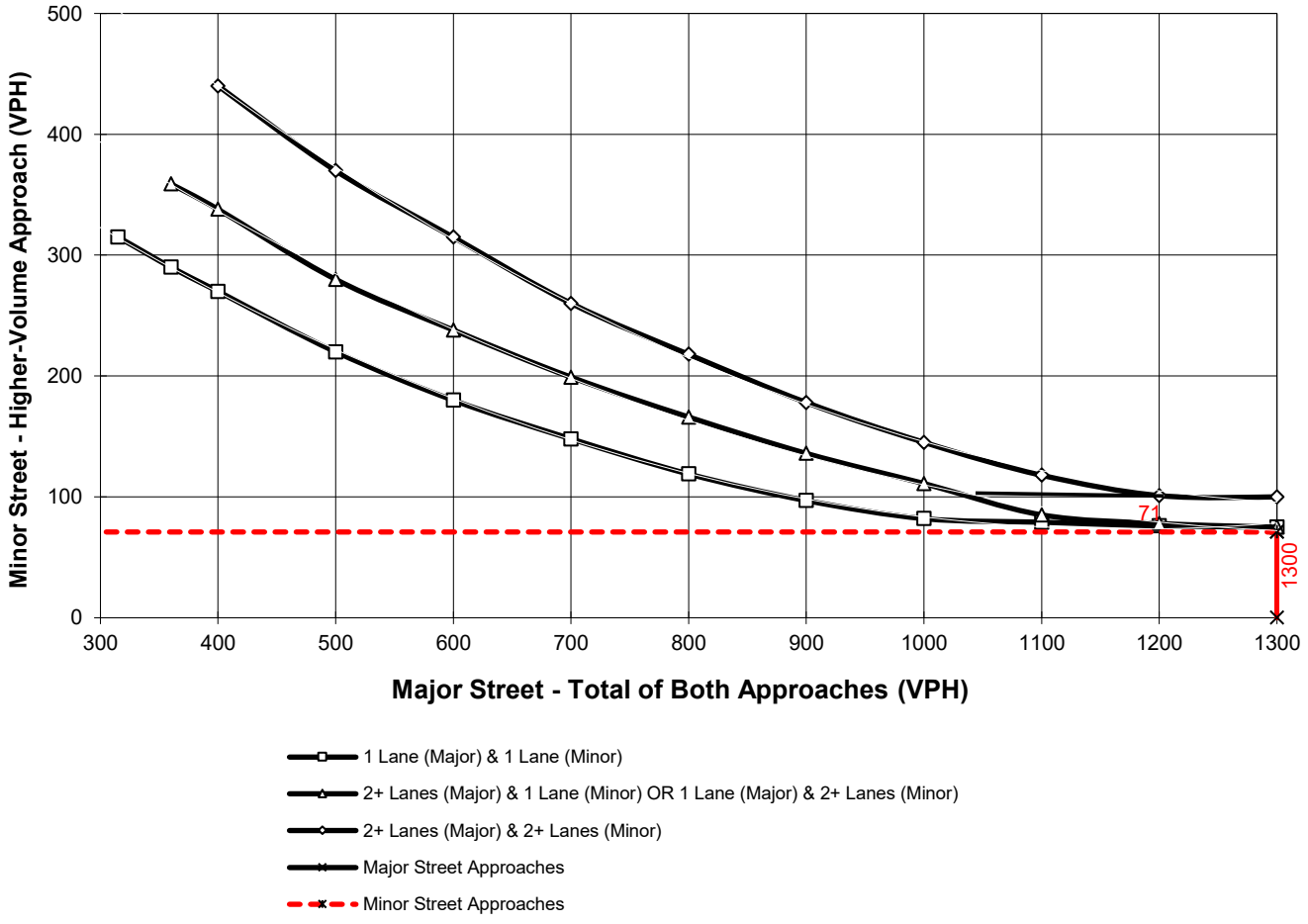
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Up to 275 Dwelling Units - Weekday PM Peak Hour**

Major Street Name = **Haun Rd.**
Total of Both Approaches (VPH) = **1370**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Wickerd Rd.**
High Volume Approach (VPH) = **71**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

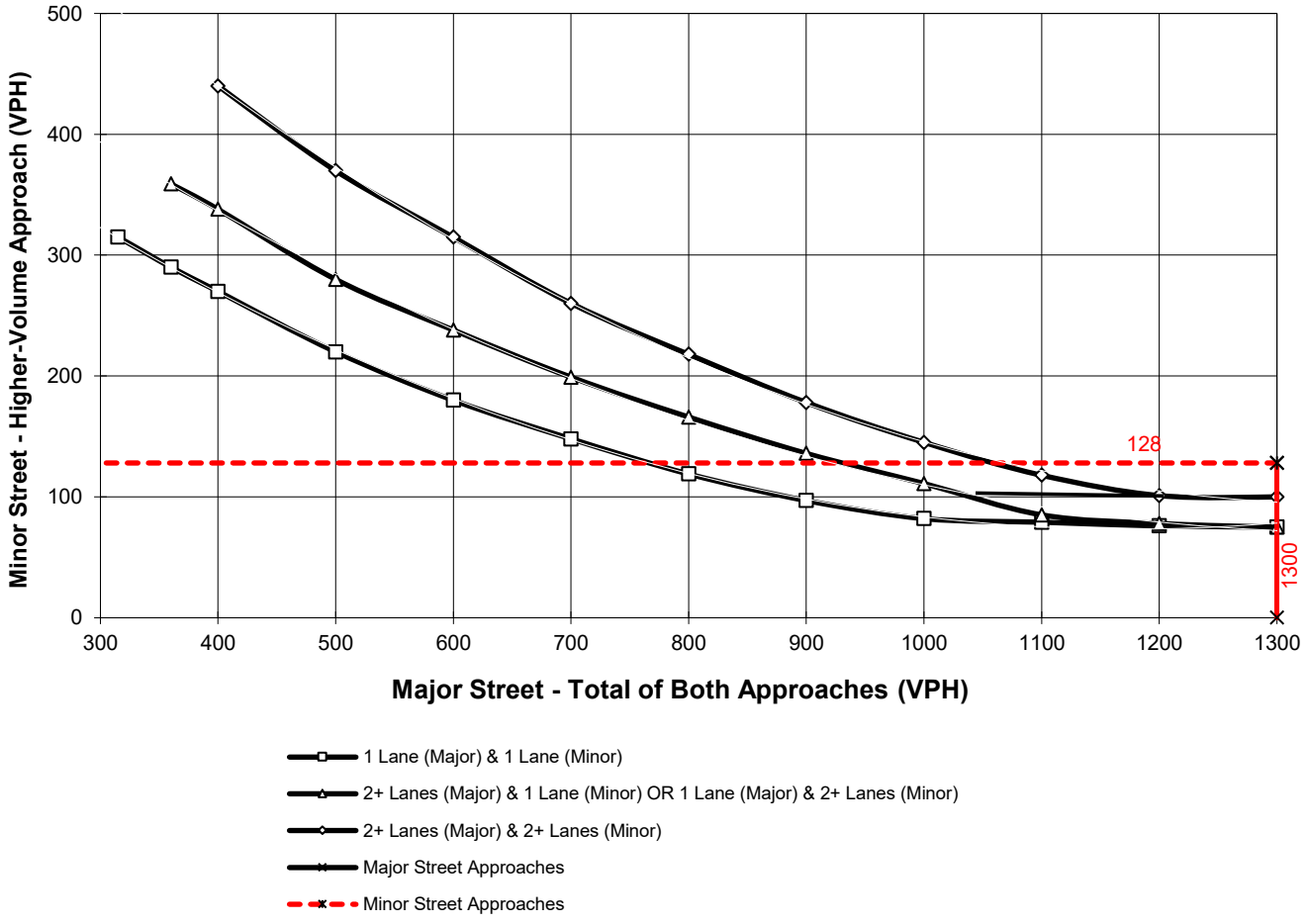
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Project Buildout - Weekday PM Peak Hour**

Major Street Name = **Haun Rd.**
Total of Both Approaches (VPH) = **1466**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Wickerd Rd.**
High Volume Approach (VPH) = **128**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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